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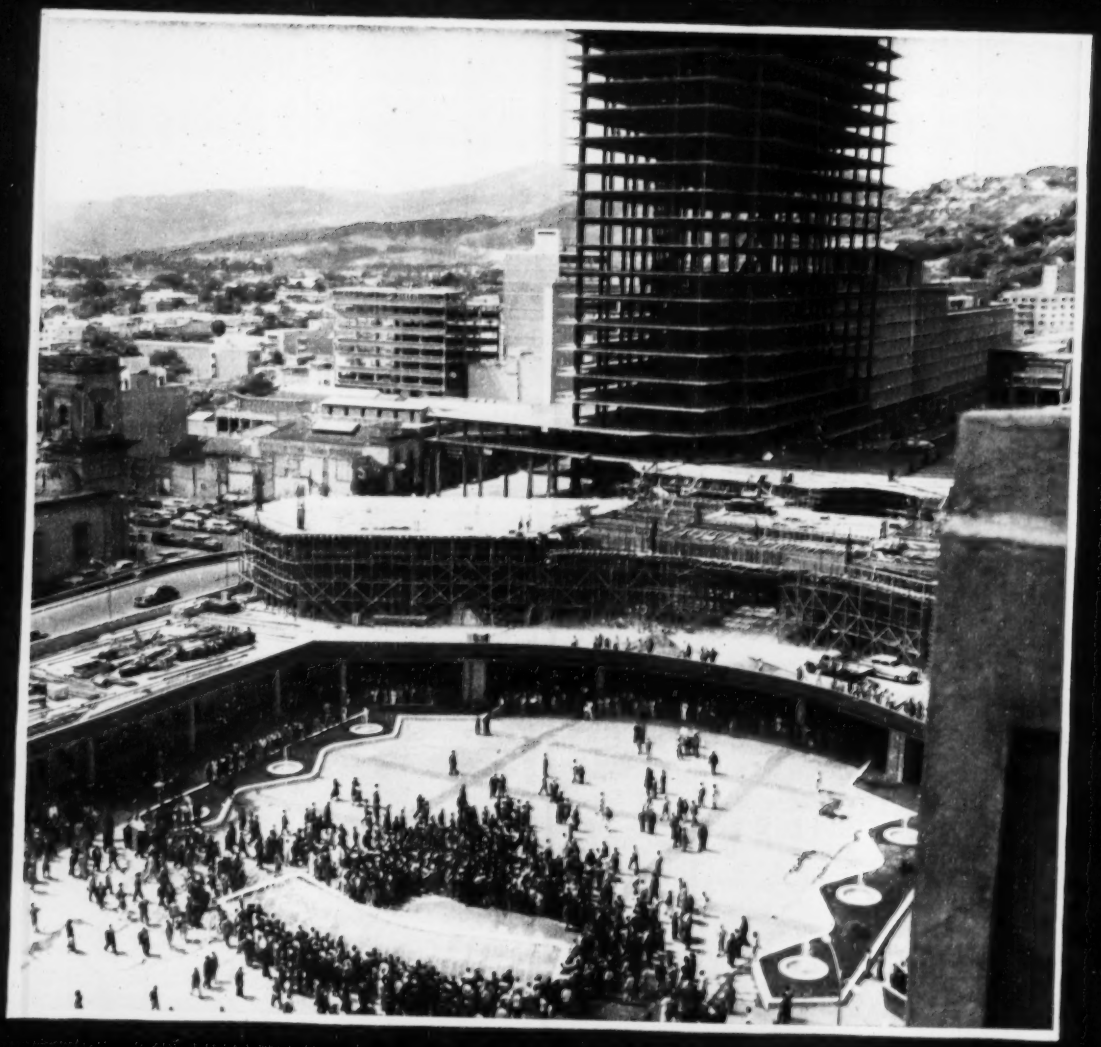

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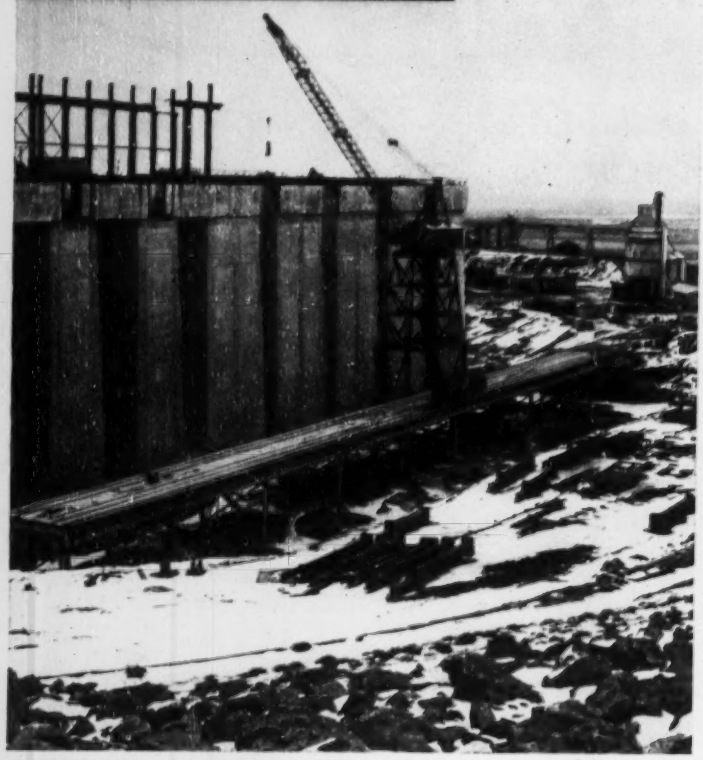
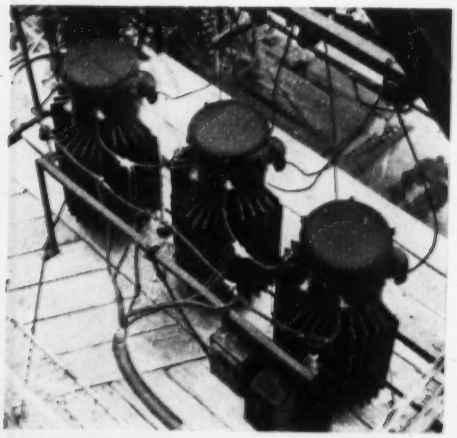
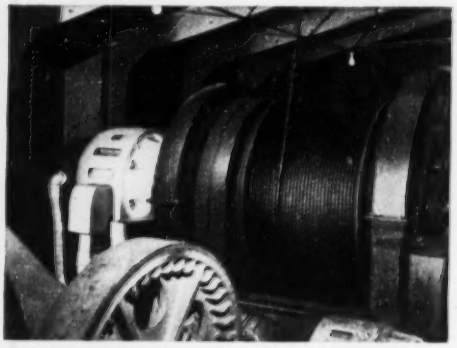


ELECTRICAL CO-ORDINATION provides continuous operation of this revolver crane 100 feet above the base of the huge intake structure. Movement along trestle is powered by a G-E 200-hp Type MR motor at foot of the gantry.



ADEQUATE POWER to maintain smooth, dependable crane performance is stepped down by these portable G-E transformers.



RELIABLE DRIVES must stand exacting demands of this revolver crane. G-E 200-hp motors and control are key to this application.

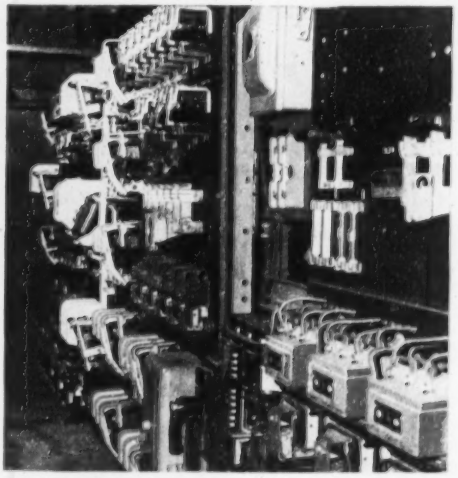
Electricity helps Garrison Dam keep round-the-clock schedule

G-E drives, still on the job after six years, are helping to harness Missouri River

At Garrison Dam near Bismarck, N. D., completely electrified equipment plays a vital role in keeping round-the-clock construction work on schedule. All electrical systems for the project's main stages were designed and co-ordinated by U. S. engineers, Peter Kiewit and Son Co., and Morrison-Knudsen Co. contractors—aided by G-E application engineering. This engineering teamwork resulted in maximum working capacity and fast, smooth operation.

Let G-E application engineers help *you* get the most from your construction equipment through electrification—from the smallest drive to the largest power distribution system. Contact your nearest G-E Apparatus Sales Office. General Electric Co., Schenectady 5, New York.

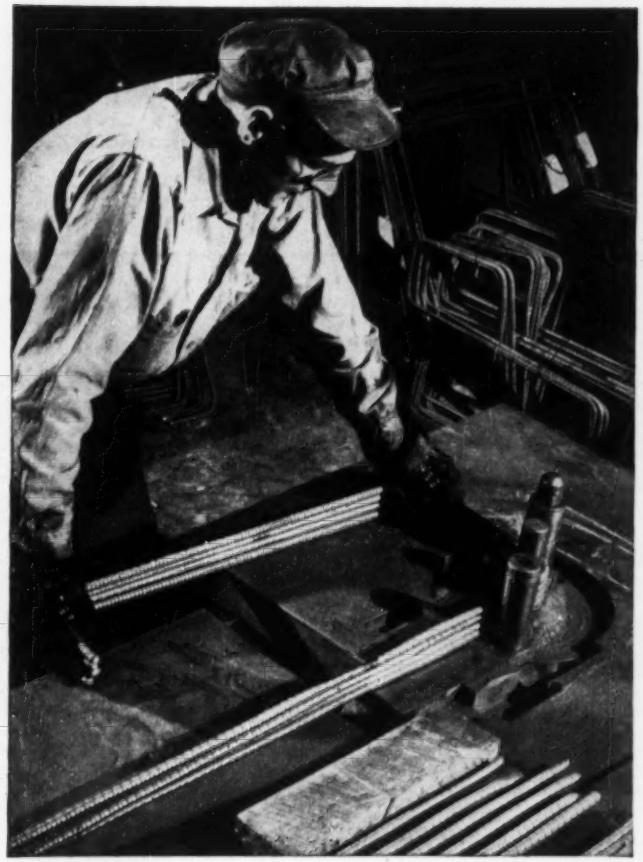
664-31



CENTRALIZED CONTROL equipment on this compact G-E panel is mounted in the cab for simple one-man operation.

Engineered Electrical Systems for Heavy Construction

GENERAL ELECTRIC



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Robert F. Boger
Publisher

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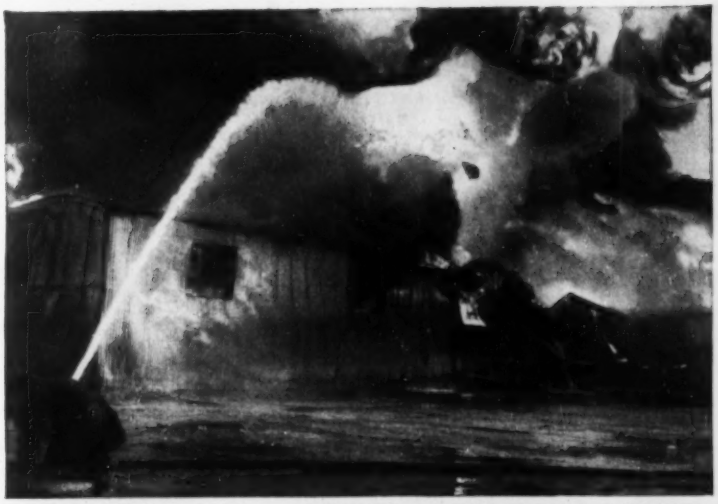
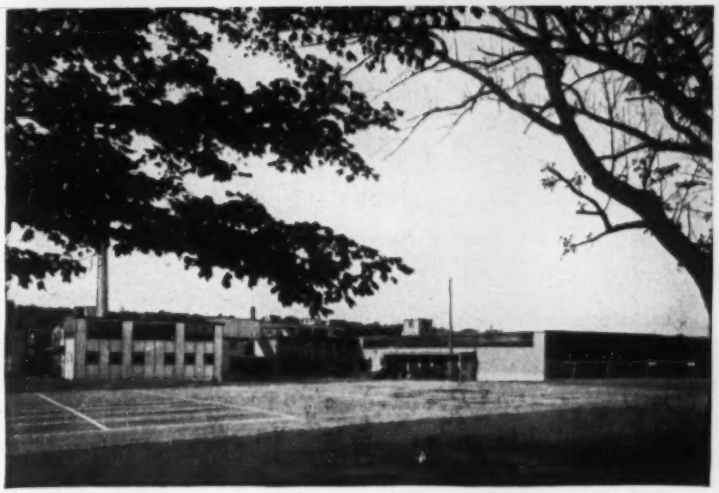
Height of the fire



at two chemical plants



One plant is a seething inferno. Several were injured in this $600,000 mid-western chemical fire.

How different the story at the other chemical plant. When fire broke out at Arnold Hoffman & Company, Inc., Dighton, Mass., there was no rapid spread of flames. No one was injured. The blaze was confined to a single area of the plant and the damage was negligible.

What did the Arnold Hoffman plant have which the other chemical plant did not have? The protection of a Grinnell Automatic Sprinkler System!

There is a Grinnell Fire Protection System for every fire hazard. These systems provide for the effective control of fire — *at its source.*

Remember, a Grinnell System often pays for itself in a few years through reductions in insurance premiums. So if you have fire insurance, you are probably paying for Grinnell Protection anyway . . . *why not have it!*

A Grinnell engineer will gladly advise you on the proper Grinnell System to protect *your* property. Write Grinnell Company, Inc., 258 West Exchange Street, Providence, Rhode Island.

HERE IS A PARTIAL LIST OF THE DIFFERENT FIRE PROTECTION SYSTEMS WHICH GRINNELL CAN ENGINEER TO FIT *YOUR* PARTICULAR NEED . . .

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SAYS SUP'T. STONEBRAKER OF A. J. GLASER COMPANY, MUNCIE, INDIANA

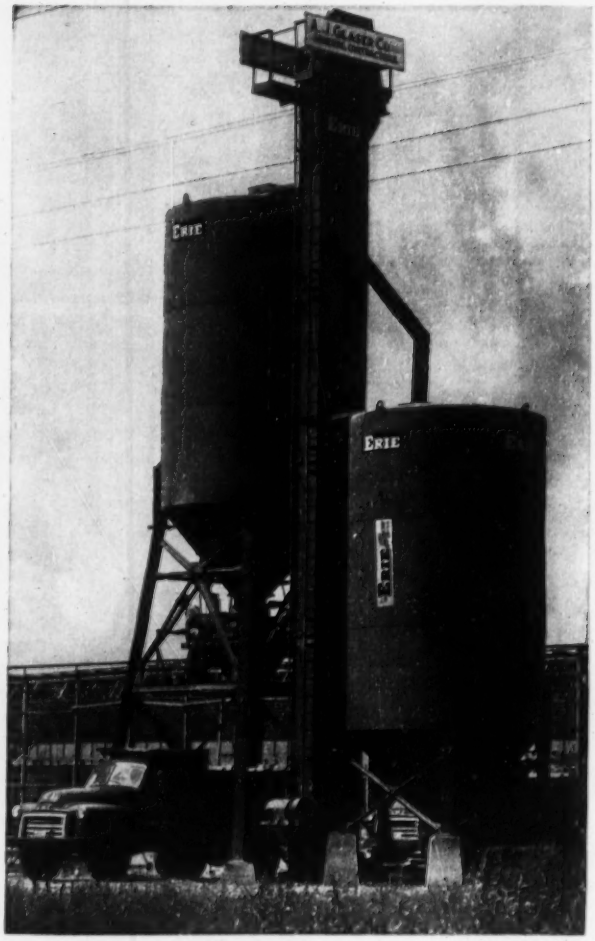
"And why shouldn't we be! We knock it down, move it and set it up all in 3 days. Makes a perfect setup for truck mixers, too!"

●

Continues Mr. J. H. Stonebraker, "We know Erie equipment. For the past 7 years we've been using their Strayer Portable Concrete Mixing Plant. Our experience with this unit prompted us to buy the Erie Strayer Bulk Cement Plant. We're more than satisfied with the installation."

Important as it is, quick knock-down and set-up aren't the only advantages our owners get out of their Erie Strayer Plants. Other features are: accurate, high output plants and fast service on repair parts.

If you're thinking about a portable batching or mixing plant, don't decide till you get the Erie Strayer story. Learn for yourself why most Erie owners repeat with Erie Strayer equipment when expanding.



Glaser's installation includes: 2 CSB silos with a total capacity of 900 bbls; a 20 cu. ft. Cemetor (type DWH) with approximate capacity of 2400 cu. ft. per hour; and, a 50-TPH Elevator. One man handles entire operation. Sold by Seastrom and Company, Indianapolis, Indiana.

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"Universal tread prevents side-slip," construction foreman reports

THE Kessler Contracting Company does road construction work around Mount Carmel and Shamokin, Pennsylvania. Thirty trucks, 6 scrapers and 6 other units haul loads as heavy as 20 tons over hilly, rut-filled roads where tire skidding and side-slippage is a constant threat.

To avoid this danger, Kessler uses B. F. Goodrich off-the-road tires. Foreman Rufus Steiger (above, right) reports they prevent side-slip, give much better service than any other make of tire.

The B. F. Goodrich Universal tire grips with husky, wedge-shaped cleats. The cleats are non-directional to give positive traction in reverse or forward and to guard against slippage. You pull through the toughest jobs without wasting time and money on bogged-down trucks. And the tread is made of specially-compounded rubber that resists cuts and snags.

Kessler is able to recap its BFG tires twice—each recap saving the company hundreds of dollars—because of the extra-strong construction. Layers of strong, elastic nylon cords under the tread stretch together to protect the tire body from shocks and bruises. This patented nylon shock shield costs you nothing extra, yet gives you more original tire service, more recappable tires and more hours of service per recap, increased bruise resistance and less danger of tread separation.

See the complete money-saving line of B. F. Goodrich off-the-road tires at your retailer's store. The address is listed under Tires in the Yellow Pages of your phone book. Or mail the coupon.

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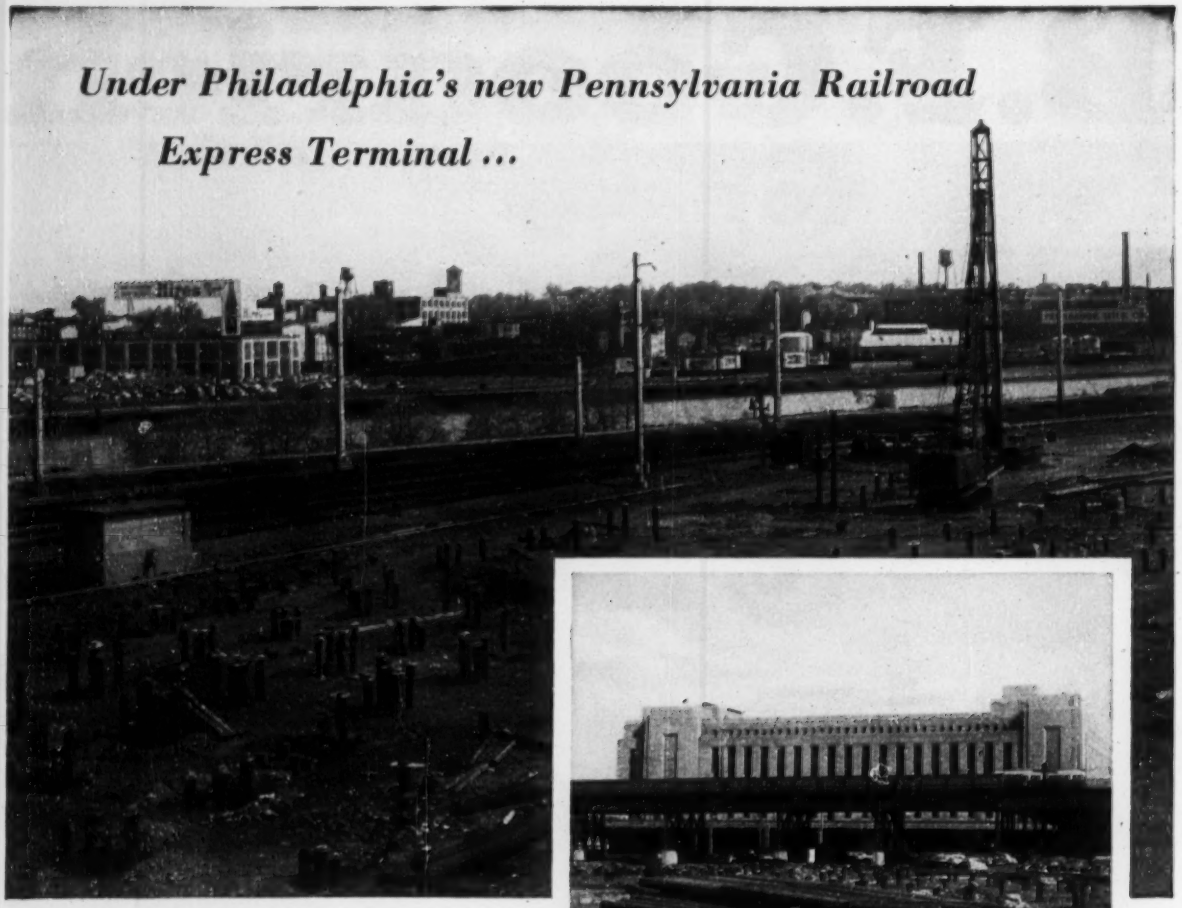

Inset shows Monotubes field-spliced to required length, ready for fast, easy driving by Pile Driving Contractor Brann & Stuart Co., Philadelphia, Pa.

JOB SIMPLIFICATION with Monotube Piles

30,000 lineal feet of Monotube piles will support the new Pennsylvania R.R. express facilities in Philadelphia—a two-story, reinforced concrete building 150′ x 60′ and a reinforced concrete platform 825′ x 100′ covered by a steel superstructure. Standard Monotube piles of 11 gauge steel with 8″ tip and 12″ butt diameter were used. The piles averaged 48′ in length.

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Weigh these and other Monotube advantages. They pay off well on *all* types of jobs. For the latest information write to The Union Metal Manufacturing Co., Canton 5, Ohio, for a copy of Catalog No. 81.

Monotube Foundation Piles

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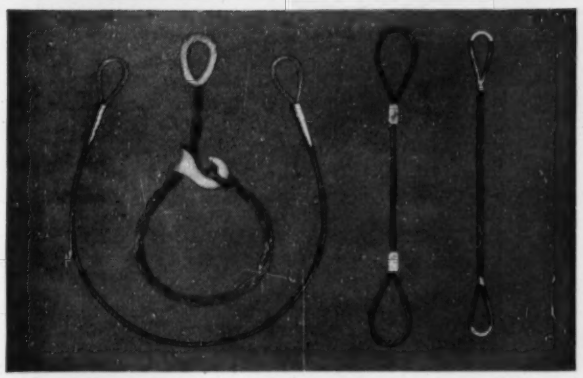

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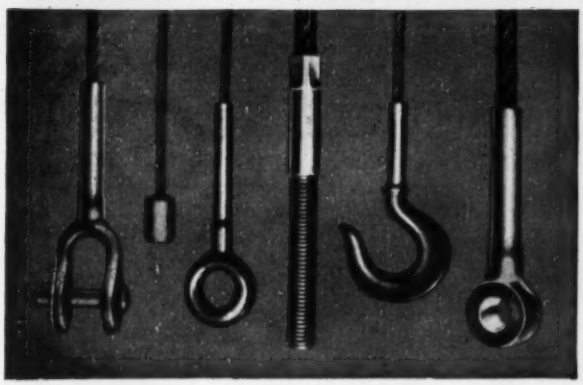

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READER COMMENT

Bridge accidents

SIR: Accidental destruction of bridges by highway vehicles has frequently occurred because the structures were not anchored for, or protected against, the impact of vehicles moving out of control.

The bridge design specifications of the German Railways have required, since Feb. 1, 1934, that, unless suitable fenders are provided, a force of 220,460 lb should be applied 3.94 ft above the sidewalk level, at both axes of symmetry of the section, in the design of columns supporting undercrossings. The effects of this force are additional to those of the design loads, except wind. The yield stress is allowed for this loading combination.

Providing fenders against ship impact has been standard practice. Likewise, the protection of columns and the end-posts of trusses against vehicle impact should be specified. The provision of excess sections and special anchorages may not be as efficient as energy absorbing installations. The latter are suitable for the protection of existing structures.

LOUIS BALOG
Consulting Engineer
Binghamton, N. Y.

Canal sector gates

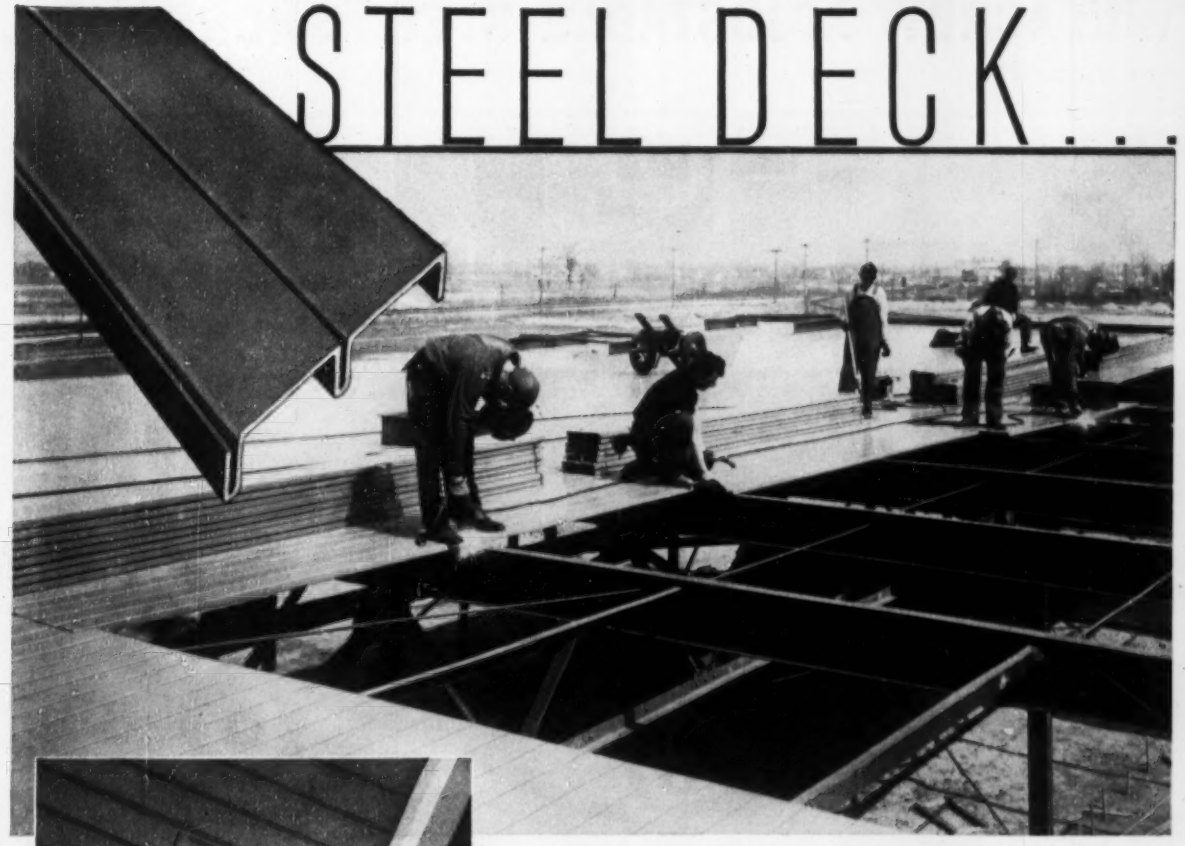
SIR: Your readers may be interested to know that the sector gates of the Algiers lock described in the Nov. 26 issue of ENR, p. 42, are not the first of their type built in this country.

During the 1930s, sector-type gates were constructed by the Okeechobee Water District in the Everglades of southern Florida. These were successful in reducing turbulence in the lock chamber by passing the major portion of the water entering the structures through recesses constructed behind the pintles. However, both the direct and reverse heads on these sector gates were relatively low compared with those encountered on the lower Mississippi River.

The Florida sector-gate designs and actual test-run results were used by the New Orleans District of the period 1937-40 in the design of partial locks at Berwick and Charenton, La., on the Intracoastal Waterway and for the Bayou Sorrell Lock on the alternate route of the Intracoastal Waterway south of Plaquemine. The latter structure was designed for the New Orleans District by the Upper Mississippi River Division.

(*Continued on page 12*)

STEEL DECK . . .



BUILT-UP SADDLES ELIMINATED

Built-up saddles are eliminated in Steel Deck Roofs. Purlins can be set to create valleys at sump locations in the drainage area. Steel Deck can be warped to conform. No additional deck plates are required—no cutting, fitting or bending necessary.

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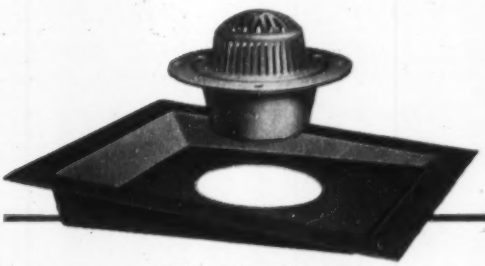
Steel Deck continues to gain favor in the industrial and commercial building fields. Why? . . . because steel deck is the logical and most practical deck material available for roof construction today. And it's more economical, too. Steel Deck's light weight permits substantial savings in the supporting structure . . . it can be insulated to the exact degree to meet local "U" Factor requirements—total dead roof load, including insulation and waterproofing materials, will prove to be less than any other type of permanent, firesafe roof construction in any given locality. And, important too, Steel Deck can be installed in any kind of weather . . . erection progresses rapidly—no waiting for materials to dry. Mahon Steel Deck is available in Galvanized Steel, Enamel Coated Galvanized Steel, or Enamel Coated Black Steel. Stiffening ribs are vertical—no angular or horizontal surfaces where troublesome dust may accumulate. In the enamel coating process, the metal is chemically cleaned, phosphated, and treated with a chromic acid solution to provide paint bond, and the protective coating of synthetic enamel is baked on at 350° F. prior to roll-forming. Investigate these extra-value features of Mahon Steel Deck . . . See Sweet's Files for complete information, or write for Catalog B-54-A.



SUMP RECESSES and SUMPS

Mahon Roof Sump Recesses for use with Mahon Steel Deck can be furnished to fit any roof pitch. Mahon Cast Iron Sumps can also be furnished for 4", 5", and 6" conductors.

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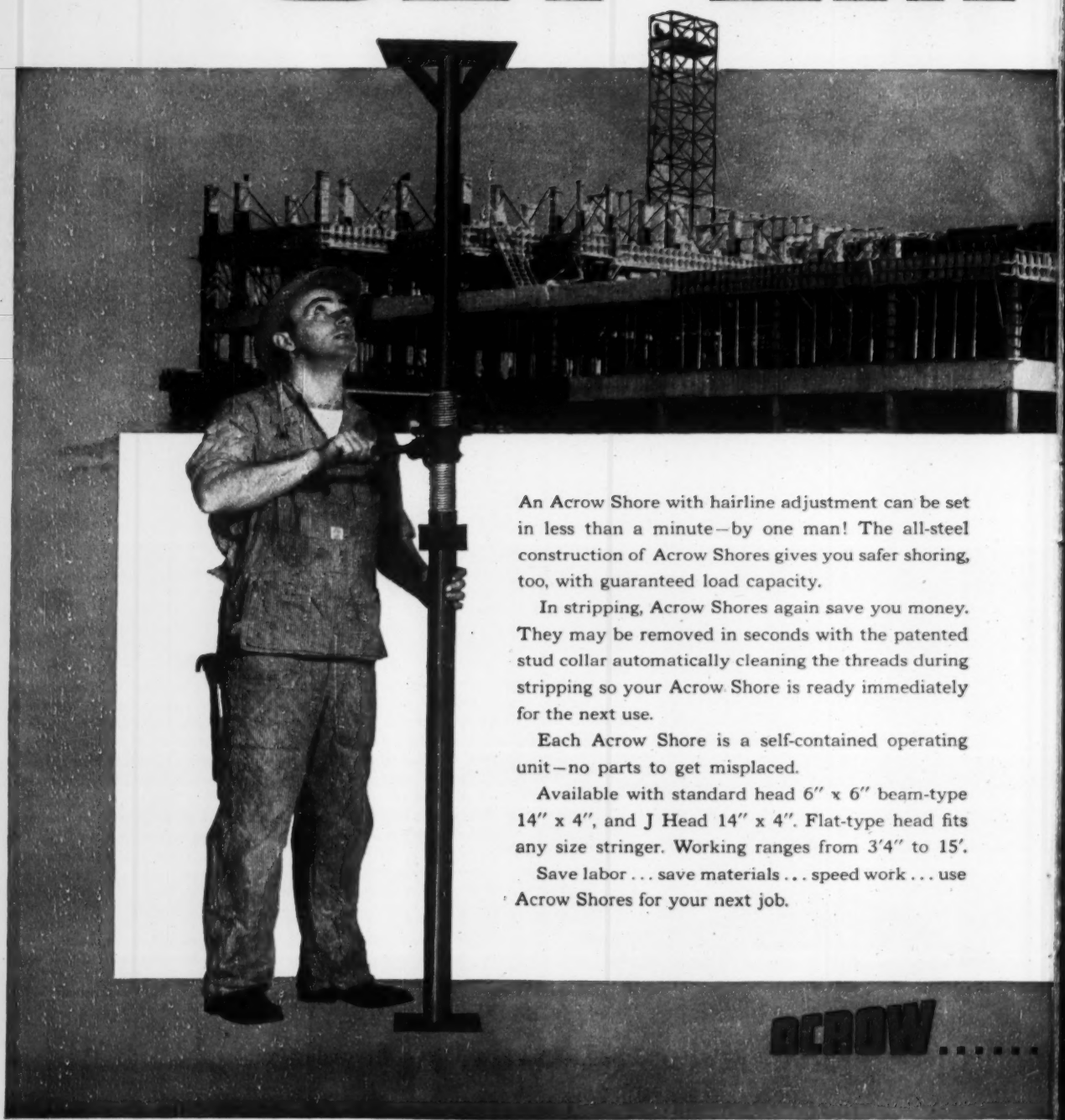

An Acrow Shore with hairline adjustment can be set in less than a minute—by one man! The all-steel construction of Acrow Shores gives you safer shoring, too, with guaranteed load capacity.

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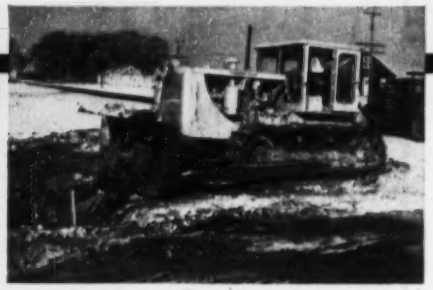

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READER COMMENT

Construction of the Berwick and Charenton floodgates was left during World War II partially finished. After the war, the Berwick structure was expanded and completed as a lock; the Charenton floodgate was completed, and contracts awarded for construction of the Bayou Sorrell Lock and for partial locks at East and West Calumet, the junction of the Intracoastal Waterway and the Wax Lake Outlet, a few miles west of Morgan City and Berwick.

All of these structures are sector-gate types as are several others which were planned for construction after the war, such as Port Allen lock near Baton Rouge, La., the Bayou Boeuf lock near Morgan City, La., the Grand Lake Ridge lock south of Lake Charles, and the Grand Chenier lock and control structure.

The above named structures were forerunners of the Algiers lock and together with model studies and experiments developed by the Waterways Experiment Station at Vicksburg, Miss., presumably were used as a basis for its design.

JOSEPH J. ROSA
Eatontown, N. J.

[EDITOR'S NOTE: As stated by Mr. Rosa, the gates of the Algiers lock are an outgrowth of earlier studies of this type, which in turn were based on Swedish designs, as noted in the article on the Algiers gates, which are noteworthy for the large reduction in turbulence that has been obtained by major improvements over the earlier designs.]

Code may be amended

SIR: Your article, "Code confusion: It hampers wall design," (ENR Dec. 24, 1953, p. 21) may spur some building officials to make another attempt to have panel-wall construction considered by governing bodies.

We expect to re-introduce a bill before the Board of Aldermen within the next few weeks to amend our building code to make panel-wall construction permissible in St. Louis. A previous bill introduced about two years ago died for lack of support.

A. H. BAUM
Building Commissioner
City of St. Louis, Mo.

Comment on Paducah

SIR: For three long painful years we have been struggling with a fantastic labor situation in the Paducah area. We have, through powerful exposure,

(*Continued on page 15*)

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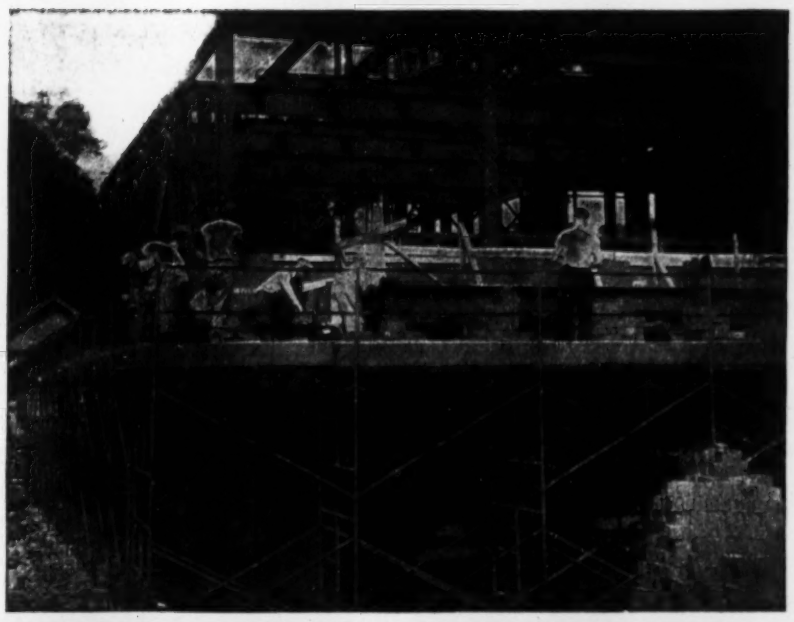


NEW YORK MASONS

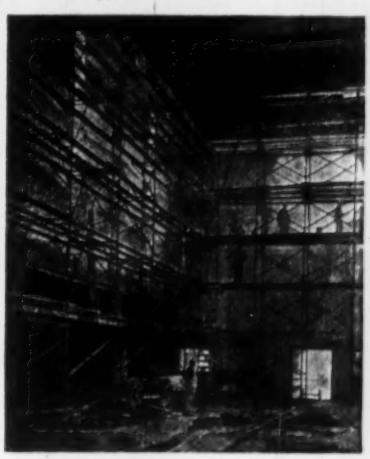
work on new power plant building at the State Hospital in Middletown, N. Y. L. B. Strandberg and Sons Co., Inc., Chicago general contractor, purchased the "Trouble Saver" Sectional Steel Scaffolding used on this job. The 5-ft high mason-type frames shown here in use are designed to provide a convenient, multi-level scaffold with a maximum number of sidewall bracket positions for masons' use. "Trouble Saver" Scaffolding, described in free Bulletin PSS-24, is one of the many types of scaffolding offered by PS Co.—the only complete line for every job, big or small. Be sure of the right equipment for your job — follow the practice of experienced contractors and—*when it comes to scaffolding, come to PS.*

MIAMI SHORES—

For the Blue Horizon Hotel's new cabanas, Florida contractor Morris Burk cut concrete shoring costs by using "Trouble Saver" Sectional Scaffolding and I-beams set directly on scaffolding frames. Plywood panels were laid on I-beams without fastening. The new technique eliminates framing, also ends stripping. "Trouble Saver" Scaffold used: 52 5x5-ft deep-trussed end frames, 20 6½-ft shallow-trussed end frames, 72 6½-ft deep-trussed end frames, 288 plain bases, 288 20-in. adjustable extension legs; 120 5-in. I-beams.

RENOVATION IN ILLINOIS—

Removal of old cornices, installation of new stone copings and a new synthetic granite front, replacing of windows and painting the upper floors of the 8-story building at 12-22 North Michigan Ave., Chicago, required this big "Trouble Saver" Scaffold. To erect the 92-ft high scaffold, The Patent Scaffolding Co.'s Chicago office supplied 315 pre-fabricated scaffold frames to Enjay Construction Company. Here workmen are removing the old cornice preparatory to installing a simple stone coping.



PORTLAND PLASTER

contractors Cann & Gray rented this five-level "Trouble Saver" Sectional Steel Scaffolding structure to safely speed plastering of a new church at S. E. 18th and Division Streets in Portland, Ore. This "Trouble Saver" assembly employed shallow-trussed end frames, 6½ ft high, giving workmen ample headroom when walking along the scaffold platforms. Also note the "Trouble Saver" Scaffolding sidewall brackets, employed here for extra platform working area for plasterers.

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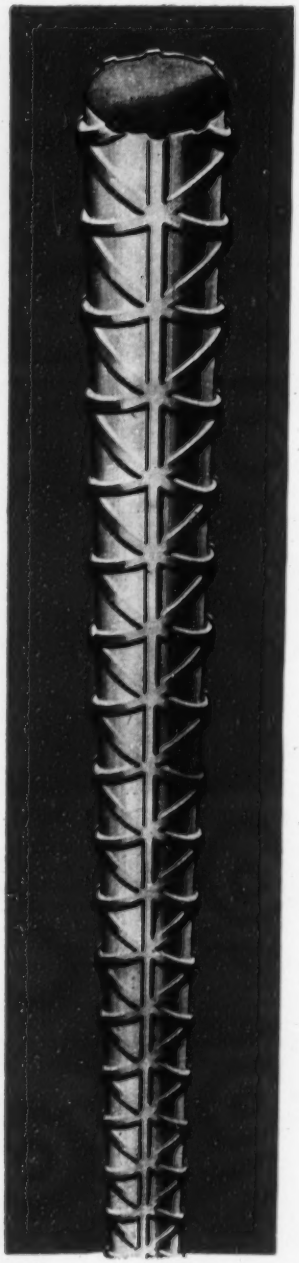

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READER COMMENT

no doubt, stored up some knowledge of the situation and have come to many conclusions.

One conclusion is that 99% of the visiting writers here to pass judgment on our labor and community troubles, go home and turn out a batch of warped sentences which they, in all sincerity, probably, label as "The Truth At Paducah."

Your mazagine did the opposite of that (ENR Nov. 19, 1953, p. 21). We have never read a better Paducah labor story. It was a penetrating, thorough, unbiased and accurate job of reporting. We are grateful for the privilege of reprinting the story in full, with credit to Mr. Orick and ENGINEERING NEWS-RECORD.

Reaction to the story has been very good.

If we can be of any service to ENGINEERING NEWS-RECORD, feel free to call on us at any time.

EDWIN J. PAXTON
Publisher
The Paducah Sun-Democrat

CALENDAR

Conference on Prestressed Concrete, University of Toronto, Toronto, Ont., Jan. 28-29.

Associated Equipment Distributors, Waldorf Astoria Hotel, N. Y. City, Jan. 31-Feb. 4.

Association of Asphalt Paving Technologists, Kentucky Hotel, Louisville, Ky., Feb. 1-3.

Street and Highway Conference, University of California, Los Angeles, Feb. 3-5.

Ohio Water Clinic Conference, Ohio State University, Columbus, Feb. 11-12.

N. J. section American Water Works Association, winter meeting, Essex House, Newark, N. J., Feb. 16.

Northwest conference on road building, University of Washington, Seattle, Feb. 17-19.

National Society of Professional Engineers, Hilton Hotel, Albuquerque, N. M.

Highway Engineering Conference, University of Colorado, Boulder, Feb. 25-26.

American Concrete Institute, Golden Anniversary Convention, Shirley-Savoy Hotel, Denver, Colo., Feb. 22-25.

American Concrete Pipe Association, annual convention, Fairmont Hotel, San Francisco, Calif., Feb. 25-27.

Associated General Contractors of America, Hotel Statler, Los Angeles, Calif., March 1-4.

Illinois Highway Engineering Conference, University of Illinois, Urbana, March 2-4.

N. Y. State Association of Highway Engineers, Arlington Hotel, Binghampton, N. Y., March 3-5.

Association of Highway Officials of the North Atlantic States, Hotel Shoreham, Washington, D. C., March 10-12.

Southern Municipal and Industrial Wastes Conference, N. C., State College, Raleigh, N. C., March 18-19.

American Congress on Surveying and Mapping, annual meeting and exhibit, Hotel Shoreham, Washington, D. C., March 22-24.

Southeastern section AWWA, Poinsett Hotel, Grenville, S. C., March 29-31.

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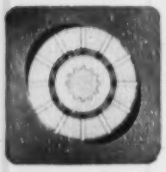
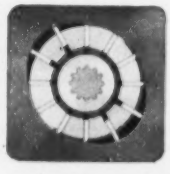
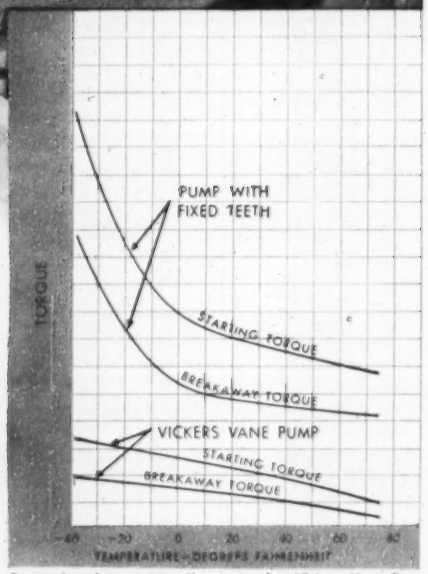


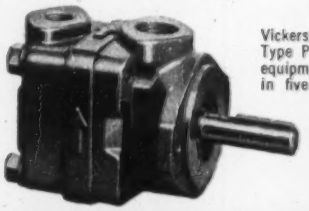


(Left) Schematic diagram of Vickers Balanced Vane Type Pump showing how sliding vanes are retracted at normal engine cranking speeds. No oil is pumped and there is practically no starting load.

(Right) Similar diagram of Vickers pump showing how pump vanes are extended when engine is running. Pumping then begins and continues at all engine speeds.



Curves based on comparative tests of a Vickers Vane Type Pump and an equal capacity pump with fixed teeth. Oil used in both was SAE 10W premium grade.



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THE CONSTRUCTION WEEK

$500-MILLION PLAN—Speculation about a "fourth crossing" of the Hudson River was rife again, after the Port of New York Authority announced it expects to spend $500 million—much of it for "bold improvements"—over the next 10 years. PNYA officials specifically named the now-building third tube of the Lincoln Tunnel, but nothing else.

But close observers pointed to a northward shift of trans-Hudson vehicular traffic, evidenced in PNYA bridge and tunnel traffic statistics. That might mean a new tunnel or bridge between the Lincoln tubes and the George Washington Bridge. Or it might mean double-decking the Washington Bridge—which was originally designed to carry rapid-transit trains on a lower deck that was never built.

One thing that's definitely out, however, is a new tunnel between the Lincoln and Holland Tunnels. Austin Tobin, port authority executive director, said this crossing (proposed in 1951) is not included.

OLD NAME, NEW FIELD—It will be worth watching that move the Arthur G. McKee Co. of Cleveland has made in changing the character of its engineering department. Up to now, McKee has confined itself closely to designing and building blast furnaces, open-hearths and petroleum refineries. Now, the company has formed a new industrial enginering division "to handle engineering contracts for other growth industries that show good potential"—such as atomic energy, aluminum reduction.

D. M. Checkley—former vice-president of J. Gordon Turnbull, Inc., consulting engineers will head the new division as general manager.

WHO'S GOT NICKEL?—Where—and by whom—the next expansion of nickel-producing facilities will come has gotten to be something of a matter for dispute.

A week ago (ENR Jan. 14, p. 19) General Services Administration said it would order a $43-million expansion of the U. S.-built Nicaro plant in Oriente Province, Cuba—now being run by National Lead Co. with Cuban participation.

That expansion, according to a GSA source, effectively would kill plans of Freeport Sulphur (which designed the Nicaro plant for the U. S. government, incidentally) for an $80-million government advance to develop a sulfuric acid leaching process to handle ores from newly developed sources on Cuba's Moa Bay.

Not so, said Freeport Sulphur executives: They can get private financing for their plant—and will go ahead with plans to build it, without government advances.

Fighting hard to get in the last word, GSA said it would grant Freeport a purchase agreement, if private financing could be arranged.

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WASHINGTON OBSERVER

Construction will feel the impact of Eisenhower's "welfare program." Probably the most significant change: blanketing self-employed architects and engineers into the Old Age and Survivors Insurance Program. This would be compulsory on these professions, although some new groups—clergymen, for instance—would come under social security only if they elected to. You would pay your tax each year on a special form along with your federal income tax return. The tax would be effective on your 1955 income, if Eisenhower's recommendations go through. The rate would be 3% on the first $4,200 of income earned in the covered profession—or $126.

Federal aid to medicine would go to some new kinds of construction. The President would build more nursing and convalescent homes for the chronically ill or disabled to relieve congestion of general hospitals (see page 21).

Unemployment compensation and minimum wage legislation gets the big play as the mainstays of the Republican labor program. Idea is that these are best moves at this time to counter a business downturn. Congress will vote to expand coverage of unemployment compensation—and eliminate exemptions now given many industries from coverage of minimum wage. But Taft-Hartley amendments are completely snarled over Eisenhower's proposal to have government-run strike votes.

•

How much anti-depression action is coming from Washington will become clearer once the President's Economic Council gives diagnosis and remedies on Jan. 28. Though the council's report will have no dollar signs and specific projects in it, there will be the warnings and philosophy.

Right now the Administration figures its biggest incentive for continuing business activity is in its tax program—giving a better depreciation break to manufacturers, suppliers and builders for their plant and equipment. The House Ways and Means Committee will approve a stepped-up amortization schedule, granting the right to writeoff two-thirds of new capital expansion in plant and equipment in half the life of the particular building or steam shovel. The expiration of the excess profits tax Jan. 1 and any jiggling of the corporate rate on April are added incentives.

But the economic advisers will look longer term. Eisenhower talked in his State of the Union about more aids to small concerns to keep them in business; more tax relief to consumers and pushing of quick-to-build public works also are in prospect if the economists see any drastic lull in business activity. Eisenhower had this in mind in approving starts this year on 23 projects.

•

Congress is beginning to act on some other construction projects.

The $21-million Santa Maria water storage project in California is up for a House vote; and the proposed new Air Force academy has committee approval. Both must still go through the Senate.

The Upper Colorado River storage project already is under debate. Interior Dept. officials began defending the three-dam program they've sent to Eisenhower this week. Particularly, they defended building of Echo Park Dam, which wildlife and national park enthusiasts oppose on the ground the construction would mar the scientific and tourist attractiveness of Dinosaur National Monument. House Interior Committee has project under hearing.

•

Watch the Supreme Court in the United Construction Workers vs. Laburnum Construction Corp. case. The court will decide whether an employer can sue a union in connection with an organizing campaign outside the Taft-Hartley Law's unfair labor practices code. The court has twice this term ruled that Taft-Hartley is supreme in unfair labor practices cases. But this week it accepted for decision a Virginia court's ruling that held UCW organizing activities damaged and intimidated Laburnum and entitled him to compensation as a plain case of common law injury.

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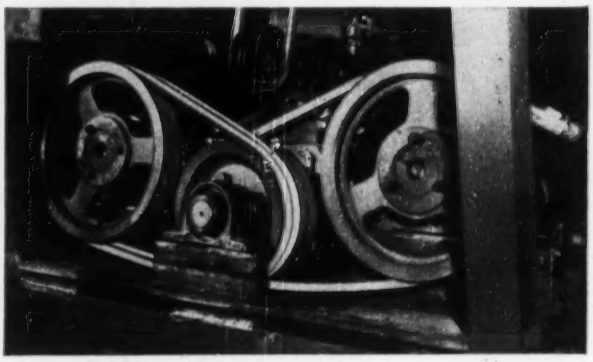

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Military asks $1.1 billion in new construction funds

Pentagon to seek authorization at this session of Congress for further projects costing just as much money

Congress will be asked to appropriate more than a billion dollars for new military construction in fiscal '55. And, the Pentagon will seek authorization at this session for further projects costing as much again.

Request for $1.1 billion for military construction funds was contained in the President's budget message this week but details of the work to be covered by these appropriations won't be ready until perhaps April. However, the funds will be earmarked primarily to finance contract authority previously granted.

(Other aspects of budget message not available as ENR went to press. These will be considered in next week's issue.)

Even before the Pentagon sends up detailed estimates to back up its $1.1-billion request for fiscal '55, it will ask Congress for new authority to start work on an additional billion to a billion and a half dollars worth of new work. This will come in the form of an authorization request to be sent to Congress some time in February.

• **$268 million released**—Congress this week gave approval to the military to go ahead with about $268 million of construction at military bases in the U.S. and abroad. This expenditure comes from funds already available to the Pentagon—but which they were unable to commit until the House and Senate Appropriations Committees had specifically approved the projects and the amount of money to be spent. House committee approval clears the way; the Senate committee had approved the projects and amounts earlier.

During fiscal 1954 which ends June 30 the military will have spent about $1.7 billion on military construction. According to present estimates, expenditures for fiscal 1955 will run about the same. That's down about a half billion dollars from the annual rate for fiscal 1953 which ended last June. Chances are, however, that if Congress votes approval of proposed military construction programs, the spending rate again will climb to more than $2 billion by fiscal '56.

The emphasis on new military construction will still tend toward air bases and related facilities. But, the radical change in the military services ordered at a White House meeting of the National Security Council last Oct. 13, is bound to result in some additional construction centered around new weapons. Some of this will involve launching sites for the Nike and other air defense missiles that are already guarding U.S. cities and military installations. In addition, existing test facilities for special weapons such as the Air Force's guided missile test range at Coca, Fla., and the armed forces special weapons project at Sandia, N. M., likely will be expanded.

• **Big carryover criticized**—Right now the military has some $2,690,000,000 in appropriations for military construction on the books and available for obligation. Of this about $1.6 billion is earmarked for domestic military construction programs and the rest overseas. Against this, there is a total of $1,607,000,000 worth of contracts let but not yet paid for. So, regardless of congressional action on new defense programs, military construction during fiscal year 1955 again will be close to $2 billion.

The existence of the huge carryover of appropriated but unspent construction funds, the House committee on appropriations said, reveals "an inability on the part of the Department of Defense to carry out a construction program which has been presented to the Congress as essential to the support of the armed forces."

President asks for more hospitals, medical facilities, in health message

President Eisenhower asked Congress on Monday to step up federal aid for added construction of hospital and medical facilities—pointing out that the national need right now is for 500,000 more beds.

In his message on health, Eisenhower laid down a more or less new approach in facilities construction designed primarily for the chronically ill and the aged. What he has in mind is something less than a general hospital, with all its diagnostic, and operating facilities, and something more than a mere dormitory.

"Certain non-acute illness conditions requiring institutional bed care can be handled in facilities more economical to build and operate than a general hospital," the President said. "Today beds in our hospitals for the chronically ill take care of only about one out of every six persons suffering from long-term illnesses. The inadequacy of facilities and services to cope with such illnesses is disturbing. . . . If there were more nursing and convalescent home facilities, beds in general hospitals would be released for the care of the acutely ill."

Eisenhower also asked Congress to contribute federal funds for more institutions to rehabilitate the disabled, institutions especially equipped for the purpose. He said his Administration has the goal of returning 70,000 disabled to work in 1955 as against 60,000 in 1953.

Eisenhower recommended amending the Hospital Survey and Construction Act along these lines:

1. Added assistance in the construction of non-profit hospitals for the chronically ill.
2. Assistance in the construction of non-profit nursing and convalescent homes.
3. Assistance in construction of rehabilitation facilities for the disabled.
4. Assistance in construction of diagnostic or treatment centers for ambulatory patients.

He added that special funds should be made available to the states to help pay for surveys of their needs. He said the Public Health Service should be strengthened in its research activities in connection with disease, sanitation, etc.

Since 1946, nearly $600 million in federal funds have been allocated to almost 2,200 hospital projects in the various states. Matched against this amount has been around $1.25 billion by the states. Under this program, facilities for 106,000 hospital beds were built, and 464 public health centers were put up. Private building during the last six years added more than $1 billion in hospital construction.

Nimbus Dam contractors seek damages from firms building project upstream

Contractors for the Nimbus Dam project on the American River near Sacramento, Calif., have filed suit for $275,725 in damages against two contractors on the Folsom Dam project seven miles upstream.

Faulty cofferdam construction and other inadequacies are charged in the action brought in Superior Court at Sacramento by Winston Brothers Co. and Al Johnson Construction Co., Monrovia, Calif., joint contractors on the Nimbus hydroelectric project.

Defendants in the case are Merritt, Chapman and Scott, New York City, and Savin Corp., Hartford, Conn., builders of Folsom Dam.

Winston-Johnson claim they sustained damages in washouts of the Folsom cofferdam Jan. 9, 1953, and May 20, 1953.

It is charged that after the upstream dams had broken, the rush of water in the lower reaches of the river succeeded in breaking the barrier protecting the Nimbus works, damaged equipment, and also halted construction until repairs could be made.

The complaint charges the cofferdams were constructed of "improper and unsuitable materials."

It is also charged that cofferdam design was inadequate and defective: that there was unsuitable and inadequate provision for spillways, escape flumes or other methods of releasing the water in a gradual and orderly manner. Furthermore, the complaint charges, "defendants knew, or in the exercise of reasonable care should have known" that injury or damage would result to persons and property situated downstream unless the cofferdams were adequate.

Folsom Dam is a Corps of Engineers project and the Bureau of Reclamation is supervising construction at the Nimbus site.

Toll financing ruled out for proposed Tampa bridge

Anticipated toll revenues would be insufficient to pay the estimated $11.5-million cost of a proposed third bridge across Tampa Bay, according to a survey submitted to Florida's State Road Board by Coverdale and Colpitts, New York consulting firm.

Traffic and earnings studies of the span indicated that the project would support about a $6-million revenue bond debt with a reasonably good margin, the engineers reported. "Theoretically," the firm said, a $10-million debt could be paid off in about 30 years with tolls, "but the debt service coverage is only 1.0 or no margin or cushion at all."

In the past, as a matter of policy the Florida Road Board has required that any proposed revenue project must show prospective earnings of no less than 1.75 times the amount necessary to cover the debt.

W. Howard Frankland of Tampa, a former road board member and leader in the move to get a third bridge across Tampa Bay, said the engineering report would be no stumbling block to construction of the span. He believed the bridge could be built as a free structure, with Hillsborough and Pinellas Counties each furnishing about one-fourth of the funds from secondary road money, the state one-fourth and the federal government one-fourth. To ease this financing the bridge could be financed only partly by tolls, he pointed out.

Toll roads are needed but not in Vermont

While other states have been busy planning toll road projects to hurry the motorist on his way, Vermont has been quietly taking stock of its own road system. One conclusion of the study: A high-speed toll road would be completely out of character.

The report (prepared by Cleveland consulting engineer George B. Sowers) takes the view that tourists do not go to Vermont to roar along speedways but to relax and enjoy the state's natural beauties. "A toll road would act as a high pressure pipeline, speeding visitors through the state and cutting them off from the very features they came to enjoy. By improving its free road system, Vermont can give fully adequate highway service in a tranquil atmosphere."

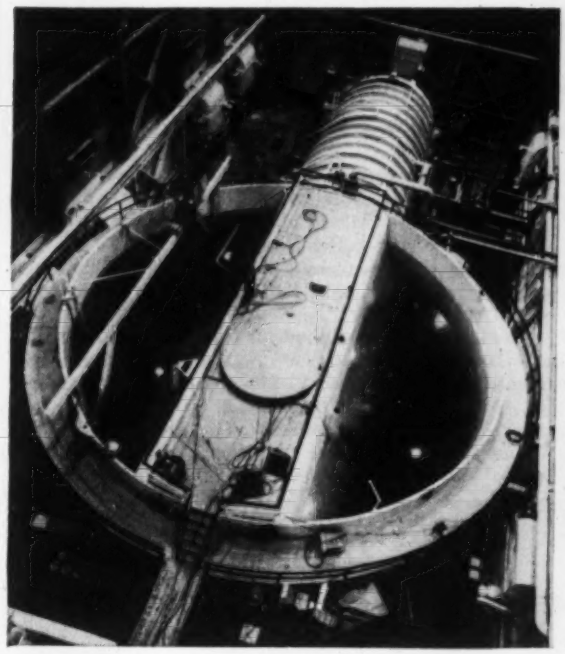
Bottlenecks in Vermont cities, says the report, can't be cured by building by-passing turnpikes. Surveys reveal that 80 to 90% of the motorists on main highways entering such cities as Montpelier, Burlington, Bennington, Brattleboro, Barre, Rutland and Newport want to drive into the cities.

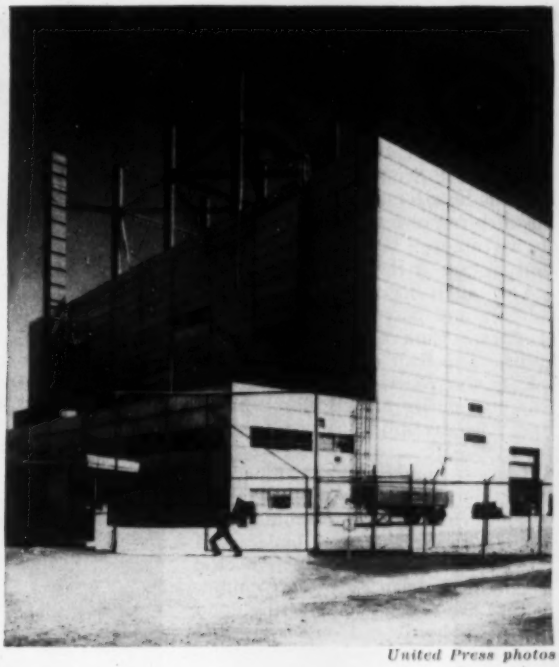
In his investigation Sowers found no section of the state where toll roads would create a substantial increase in traffic. Instead, he concludes they might reduce tourist flow.

The study does list two possible locations where toll roads might be desirable—but suggests in each instance that there are better and more economical means of eliminating traffic problems. One of these locations is the 40-mi, two-lane highway between Montpelier and Burlington on U. S. 2. The other is the 7-mi stretch between Montpelier and Barre on Route 302.

Precast panels serve as buffers for jet blast

Protection for personnel against jet plane blasts is provided by rows of precast concrete wall panels stretched across the pre-flight test area of an aircraft manufacturing plant in Columbus, Ohio. The 5-in. panels form the face of timber and steel-framed barriers—triangular in cross-section—which are secured to the concrete apron. New aircraft are wheeled into position 20 ft in front of the barrier and the panels deflect the blast of the jet engines during the testing. Although the panels are exposed to intense flame erosion and reverberatory vibration, they have withstood the punishment of the jet blasts successfully. The panels are made with a lightweight aggregate especially chosen to withstand high temperatures. George Sheaf and Co., Columbus, Ohio, was the general contractor.





United Press photos

Atom sub nuclear power plant protype

Launched this week, the Navy's newest submarine, atom-powered USS Nautilus, represented to engineers around the country a major step toward atomic power plants. The experimental atomic submarine (above) in the eight-story, windowless test laboratory in Idaho (ENR Dec. 10, 1953, p. 45) provided the first step in proving the real possibilities of generating electric power by means of nuclear reactors.

With its reactor submerged in a 50-ft-dia tank, the prototype model of the Nautilus has demonstrated its practicability. Test conditions made it necessary that the windowless building housing the model be slightly pressurized by air-conditioning to keep dust particles in the air from infiltrating into the laboratory. The building is made of concrete wall panels bolted to a steel frame. Six steel stacks on top of the laboratory provide exhaust outlets for emergency purposes. Square stack at the left is for normal ventilation.

Colorado River project gets hearing

Authorization of the $1.1-billion Upper Colorado River storage project faced two big obstacles as hearings got underway before a House committee in Washington this week.

The Department of Interior bill still lacked approval of the Bureau of the Budget. Without this—which amounts to White House approval—the Administration could not give it full backing.

Conservationists were out in full force to block the Echo Park unit of the project because it would have to be located within th confines of the Dinosaur National Monument.

Interior Undersecretary Ralph Tudor, who had conducted a personal survey of alternate sites, testified that the Echo Park site is the most feasible for a key storage unit of the project. His testimony indicated that evaporation rates of alternative sites ruled them out as a practical matter.

Two main units of the initial project are Echo Park which would cost an estimated $176.4 million, and Glen Canyon which would cost an estimated $421.3 million. Together, these projects would provide 32 million acre feet of storage and supply enough hydroelectric power to justify installation of one million kilowatts of generating capacity.

Of the total cost of these two projects, $98.3 million would be allocated to irrigation and other water consuming uses and $499.4 million would be allocated to power. Cost allocations for the remaining units of the project have not been determined.

A staff report of the House Interior and Insular Affairs Committee shows the benefit-cost ratio for the initial phase of the project would be 1.64 to 1.

Vibration of dam gates studied by Army Engineers

At Fort Randall Dam, Picktown, S. D., U. S. Army Engineers have carried on extensive tests on vibrations in the 50-ton steel gates that control the flow of water through the dam's 12 tunnels. The tests represent the first research of this type ever carried out on gates with an elastic suspension.

Each gate measures 11x13 ft and is of a vertical lift tractor type. There are two gates in each tunnel and the force of water against each one at full pool is 1,340 tons. When they are opened, water flows under the gates at 40 mph.

Field tests were performed with an accelerometer welded to the gates, and the vibrations were recorded on an oscillograph. The force of water going under them causes the gates to vibrate up and down, shake back and forth, rattle sideways, and even to flex. Data from the field tests is now being analyzed at the Waterways Experiment Station, Vicksburg, Miss. Closest scrutiny will be directed to recordings of vibrations built up when the gates are partially opened. The studies should reveal under what conditions the damaging cumulative effect of frequencies is built up. This should help to avoid the effect in future operation of the dam.

St. Lawrence

Bloc favoring construction bolstered in Senate

The St. Lawrence Seaway legislation is before the Senate again this week. But this time there is a difference—on this fifth try, observers think the Senate will approve U. S. participation in construction of the project.

The bill is opposed chiefly by the railroads and port cities on the Gulf of Mexico and along the Atlantic Coast. The floor opposition is being led by the Maryland and Louisiana senators: Butler and Beall of Maryland, Ellender and Long of Louisiana.

• **House is stumbling block**—Since the legislation was first urged on Congress by President Harding's Administration in 1922, the seaway never has reached the House floor, whereas in the Senate the Foreign Relations Committee has five times sent it to the floor.

The real hurdle in House is the powerful Rules Committee. The opposition, which stems principally from the railroads, hopes to profit from the fact that Rules Committee Chairman Leo Allen is from Illinois where railroad interests, particularly in Chicago, have come out strongly against the seaway.

The two factors that make prospects for passage this session the brightest in the history of the proposal: (1) Canada's determination to go it alone on construction of the seaway, if the U. S. fails to approve participation and (2) the push given it by President Eisenhower by putting the military defense label on it.

• **Creates corporation**—Wiley's bill calls for the creation of the St. Lawrence Seaway Development Corp., a wholly owned government agency similar to the Reconstruction Finance Corp. It would wind up with authority enough to negotiate with its Canadian opposite for (1) construction of the seaway, (2) operation of the seaway and (3) the fixing of tolls.

The new corporation would have authority to sell bonds to the U. S. Treasury to the amount of $105 million, which would finance the U. S. portion of the seaway construction. The bill provides that the corporation must assure itself that the Canadians will proceed with their navigation works legislated for during 1951, and that the State of New York and its opposite in Canada proceed with power projects tied in with the seaway.

A key point: The tolls are required to provide enough revenues to amortize the principal and interest of the corporation's debts over a period "not to exceed fifty years."

State highway plans mapped out

Three states consider major programs, others carry on as some legislatures start new sessions

At least three of the 10 state legislatures now in session must cope with problems of major highway programs, while others will handle lesser schemes, a legislative rundown by ENR indicated this week.

In the three states—Ohio, Massachusetts and New York—governors called on lawmakers for approval of highway schedules that would involve spending more than $1.5 billion toward completing master schemes previously started or planned. Other states apparently won't have such extensive work to consider—but all will be involved with the problem of providing better road transportation.

Some of those needs are indicated in the table at right.

• **Billion for Ohio**—Governor Frank J. Lausche of Ohio outlined an eight-year, $1-billion highway construction program, in his speech to a special legislative session. Last week the legislature implemented last November's $500-million highway bond issue designed to rebuild Ohio's 6,200-mi primary road system, and also voted an $82-million issue for the period ending in June 1955. Lausche pointed out that his $1-billion plan—which includes the $500-million bond issue—still would be insufficient to cure all of the state's highway ills. His program envisaged $265 million of road construction in each of the next two years plus a 300-mi. $400-million north-south turnpike between Cincinnati and Conneaut (in feasibility survey now), and a turnpike spur from Columbus to Toledo.

• **$300 million for Mass.**—Governor Herter, in his annual message recommended a six-year, $300-million highway construction program to complete the state's Master Highway Plan of 1948.

• **In New York**—Governor Dewey told solons that a method of financing construction of the Erie, Niagara, New England and Berkshire branches of the New York State Thruway will be ready in time for consideration at this session. Planning for the vital new sections of the highway is advanced, and these may be placed under construction as soon as funds become available.

• **Total highway needs**—Estimates of the highway needs of all the states ($35 billion) are given in the table on the opposite page. As reported briefly last week (ENR Jan. 14, p. 23) this table was compiled by the American Association of State Highway Officials from official estimates of the state highway departments. It covers only highways in the federal aid primary and secondary systems (totaling 672,000 mi). The estimate does not include state highways that are not in the federal aid systems, nor does it include county and township roads or local city streets.

Bachrach photo

CHARLES R. WATERS received one of HRB's distinguished service awards.

Highway Research Board makes engineering awards

Four engineers have been honored by the Highway Research Board for outstanding achievement in their fields. Awards were presented at the board's recent annual meeting in Washington.

Charles R. Waters, district engineer for the New York State Department of Public Works at Buffalo, and Prevost Hubbard, former chemical engineer of the Asphalt Institute, were given the Roy W. Crum Award for distinguished service. Both have been associated with highway research, Waters for over 25 years, and Hubbard for nearly 50 years.

Earl C. Sutherland and Harry D. Cashell, engineers with the U. S. Bureau of Public Roads, received the highway research award for the most outstanding technical paper presented at the last annual meeting. They were co-authors of a paper on "Structural Effects of Heavy-Duty Trailer on Concrete Pavement."

Federal-aid highway needs—1953

(COMPILED BY AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS)

State	Primary		Secondary		Urban		All Systems	
	Miles in need of Improvement	Cost (in thousands)	Miles in need of Improvement	Cost (in thousands)	Miles in need of Improvement	Cost (in thousands)	Total Miles in need of Improvement	Total Cost (in thousands)
Alabama	1,551	$126,131	5,411	$118,485	221	$70,778	7,183	$315,394
Arizona	1,712	126,098	2,497	68,511	73	34,814	4,282	229,423
Arkansas	2,775	234,789	11,854	280,069	115	101,323	14,744	616,181
California	4,556	982,614	5,971	646,920	534	1,077,581	11,061	2,707,115
Colorado	1,134	148,582	1,762	112,713	74	68,600	2,970	329,895
Connecticut	442	225,321	376	83,647	244	383,088	1,062	692,056
Delaware	362	63,731	983	21,597	41	40,635	1,386	125,963
Florida	2,647	223,579	3,754	172,442	364	434,406	6,765	830,427
Georgia	3,000	418,000	8,000	200,000	310	222,000	11,310	840,000
Idaho	2,024	176,754	2,439	73,064	40	15,290	4,503	265,108
Illinois	3,310	604,573	4,062	89,964	460	785,686	7,832	1,480,223
Indiana	3,374	327,343	5,683	334,179	284	65,940	9,341	727,462
Iowa	7,465	646,000	16,533	182,392	778	115,400	24,776	943,792
Kansas	3,910	338,679	10,575	116,990	168	120,150	14,653	575,819
Kentucky	3,010	240,800	13,200	528,000	105	70,500	16,315	839,300
Louisiana	2,000	160,000	3,800	91,200	198	171,282	5,998	422,482
Maine	887	84,799	694	27,974	76	45,048	1,657	157,821
Maryland	976	221,104	4,586	202,026	162	228,905	5,724	652,035
Massachusetts	813	249,460	1,910	269,028	657	442,663	3,380	961,151
Michigan	3,212	257,948	14,429	300,079	271	234,031	17,912	792,058
Minnesota	4,140	155,811	12,216	245,387	352	213,114	16,708	614,312
Mississippi	2,890	155,500	5,950	95,000	114	22,150	8,954	272,650
Missouri	5,437	385,664	11,730	101,700	243	284,000	17,410	771,364
Montana	4,200	306,600	1,950	64,350	27	10,600	6,177	381,550
Nebraska	3,416	185,311	4,952	114,080	78	31,957	8,446	331,348
Nevada	1,789	96,397	1,088	29,874	22	8,267	2,899	134,538
New Hampshire	828	88,597	852	60,243	100	23,960	1,780	172,800
New Jersey	703	881,550	1,097	112,779	255	670,300	2,055	1,664,629
New Mexico	1,852	176,530	2,367	95,660	60	24,000	4,279	296,190
New York	4,452	1,262,100	9,435	658,900	1,082	965,200	14,969	2,886,200
North Carolina	3,854	358,600	600	20,000	213	111,825	4,667	490,425
North Dakota	2,309	111,800	8,726	121,383	165	30,900	11,200	264,083
Ohio	2,800	600,000	3,900	390,000	400	750,000	7,100	1,740,000
Oklahoma	4,826	485,928	7,074	171,447	165	108,123	12,065	765,498
Oregon	2,930	216,817	3,203	106,465	108	67,285	6,241	390,567
Pennsylvania	3,800	837,880	4,656	297,015	196	213,056	8,652	1,347,951
Rhode Island	79	28,190	102	10,606	83	135,146	264	173,942
South Carolina	3,358	114,743	4,866	66,421	160	81,300	8,384	262,464
South Dakota	2,965	195,393	8,612	142,399	76	16,340	11,653	354,132
Tennessee	3,867	617,089	6,570	195,430	110	77,177	10,547	889,696
Texas	13,227	803,892	15,393	278,130	684	359,317	29,304	1,441,339
Utah	1,836	175,000	1,832	50,000	131	59,000	3,799	284,000
Vermont	806	121,461	944	34,172	35	17,570	1,785	173,203
Virginia	4,031	324,832	10,239	271,186	211	95,783	14,481	691,801
Washington	2,588	328,015	4,144	165,749	162	244,614	6,894	738,378
West Virginia	2,149	453,831	9,399	516,682	173	201,830	11,721	1,172,343
Wisconsin	4,280	428,000	14,800	624,000	200	140,000	19,280	1,192,000
Wyoming	2,145	124,975	772	22,613	27	11,804	2,944	159,392
District of Columbia	.....	.....	18	5,284	60	106,623	78	111,907
Hawaii	164	15,875	231	26,372	17	6,658	412	48,905
Puerto Rico	335	102,000	885	60,000	60	68,000	1,280	230,000
Total	**141,216**	**$15,994,686**	**277,122**	**$9,072,607**	**10,944**	**$9,884,019**	**429,282**	**$34,951,312**

Summary of mileages

	Primary	Secondary	Urban	Total
Total Approved	218,594	438,033	16,510	**673,137**
Percentage in need of Improvement	64.6%	63.3%	66.3%	**63.8%**

Reclamation Bureau names key men

Two new regional directors and an associate chief engineer for the Bureau of Reclamation were appointed last week by Commissioner Wilbur A. Dexheimer.

Frank M. Clinton became director of Region Six at Billings, Mont., and R. J. Walter took over Region Seven with headquarters at Denver. At the same time, Grant Bloodgood moved up to the newly created post of associate chief engineer in the Denver office of assistant commissioner-chief engineer Leslie W. McClellan.

No other top changes are at present planned for the regional offices or for the staff of the assistant commissioner in Denver. With the realignment of the Washington office (ENR Jan. 14, p. 7) the latest changes pretty well wrap up the reorganization that has been going on since Dexheimer took office. Choosing his appointees entirely from within the bureau, the commissioner has made an obvious effort to restore the principle of nonpartisan career service in the agency.

Last week's appointees have compiled service records of from 16 to 25 years with Reclamation. Up to last week Bloodgood was chief construction engineer at the bureau's Denver engineering center, Clinton was assistant director of Region One at Boise, Idaho, and Walter, was construction engineer on Webster Dam near Stockton, Kan.

Another bureau engineer moved up to a bigger job last week on the Denver office staff. J. R. Riter became chief development engineer in charge of the project development division, including the hydrology branch that he formerly headed.

Clinton, new director of Region Six, succeeds Kenneth F. Vernon, who remains on the Billings staff as special assistant to Clinton. In Region Seven, Walter takes the place of former director Avery A. Batson, who joins Riter's staff in the office of the assistant commissioner-chief engineer.

Cost formula questioned on McNary Dam project

In a petition to the Federal Power Commission, the Northwest Power Assn., has asked for intervention and rehearing on the interim allocation of McNary Dam costs issued in December by FPC.

The Northwest group points out that 92% of the total construction costs are allocated to power—leaving an allocation to navigation of only 8%. The allocation, claims NPA, in assigning less than 20% of total cost to navigation is "in contravention of the representations made to Congress by the Corps of Engineers at the time the project was presented for authorization primarily for navigation purposes."

NPA declares that the allocation would subsidize navigation interests at the expense of the electric power ratepayers of the Pacific Northwest. They hold that the FPC allocation order is further in error in charging navigation only 2.5% of the cost of jointly used facilities (power and navigation). NPA believes that the allocation tacitly violates a policy declaration of Congress that navigation works would be limited "to those in which a substantial benefit to navigation will be realized." If the Bonneville Dam project is a precedent, they say, then the FPC allocation fails to conform with the policy used for that project, where 50% of joint construction costs was charged to the primary purpose of navigation.

Plans filed in California for Middle Feather River

Plans for a $90-million water and power development on California's Middle Feather River have been filed by the Richvale Irrigation District with the State Division of Water Resources. Filing plans with the state is necessary to establish water rights for the project. The Richvale District is also taking action to obtain authorization from the Federal Power Commission for use of federal lands affected.

Six dams (affording 250,000 acre-ft of storage), 23 mi of tunnel, and five hydroelectric stations (installed capacity 190,000 kw) are included in the irrigation project. Water is needed to supplement the present supply for the area's rice fields, biggest in the state. Electrical energy is to be used in the public utility market to reduce the cost of irrigation water.

Richvale will coordinate its development with the State Water Board's proposed $1.2-billion Feather River project. Of major importance to California, the state project will involve a major dam and power plant at Oroville on the Feather River, and construction of canals and pumping stations to transport water hundreds of miles to water-short Southern California. The state legislature already has appropriated $1.5 million for engineering studies of the big project.

How would you vote?

Most important engineering event of 1953

The pages of *Engineering News-Record* reported many events that promise to shape for the better the future course of civil engineering and construction. What would you pick as the most significant of those events in 1953? Or if that is too difficult, what were the three most significant?

The editors believe that the opinions of readers on what was important may be as significant as the events themselves. We need your vote quickly so that results can be published in the February Annual Report and Forecast issue. Just fill out the coupon and mail.

The Editors
Engineering News-Record
330 W. 42nd St.
New York 36, N. Y.

Here is my vote on the most important engineering event(s) of 1953:

_____

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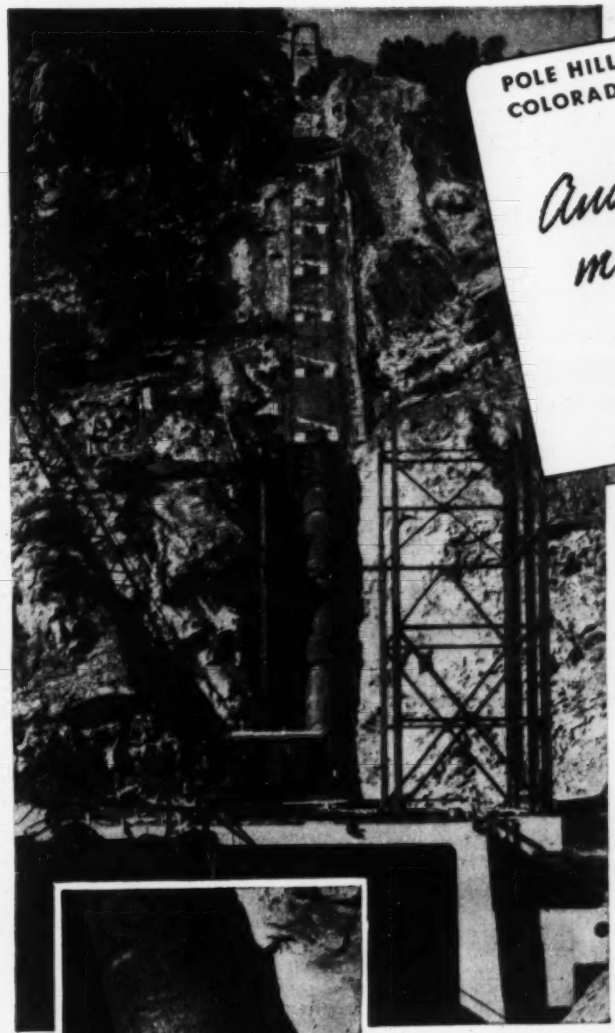

POLE HILL, COLORADO

Another Penstock job made easier with DRESSER COUPLINGS

Above—Requiring no special supports, this portion of penstock will be back-filled after field coating is applied.

Left—98" O.D. Dresser Coupling nearest powerhouse . . . shop-tested to withstand 675# psi.

Lighter, high-tensile steel pipe saves tonnage, cuts shipping costs, speeds installation of Pole Hill penstock.

A part of the Colorado Big Thompson Project, the 98" Pole Hill penstock carries water to a power house near Loveland, Colorado. The bed for this penstock is on a 34° slope, much of which was cut out of solid rock. To make this difficult construction job easier and more economical, U. S. Bureau of Reclamation engineers specified a Dresser-Coupled installation.

Dresser Couplings permit the use of high-tensile steel pipe. Thinner pipe walls *save up to 25% of total penstock weight.* Longer pipe lengths mean fewer joints and fewer anchors to prevent progressive creep. High-tensile steel pipe can be Dresser-Coupled with a minimum of time, skill and heavy equipment. **The "give and take"** in Dresser Couplings eliminates all problems of expansion and contraction. Permanent, bottle-tight joints are assured.

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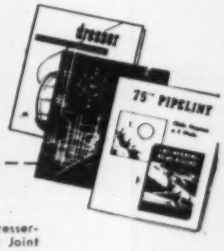

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Racketeering in St. Louis—a case history

The harsh realities of how racketeer infiltration of honest trade unions can push construction costs up to prohibitive levels and stifle physical growth of a city were being made painfully apparent this month in St. Louis, Mo.

Shakedowns, restrictive labor practices and discrimination against out-of-town contractors, detailed by a crusading newspaper and given further impact by indictment and conviction of a lengthening string of racketeers, have amounted to something of an economic education for the city.

For the construction industry these blunt facts emerged:

• ENGINEERING NEWS-RECORD's figures show construction costs in St. Louis are a whopping 10% higher than the average for eight major southern cities, and 7% higher than the average for the 20 principal cities in the United States.

• Restrictive practices have speeded the search for new building materials and techniques. Antics of the St. Louis bricklayers, for example, have resulted in reduction in demand for their services as builders turned to substitute materials. No figures are available—but it is certain that some construction business has been lost.

The major disclosures, together with subsequent indictments, stemmed from spadework done during the past two years by Carl Baldwin, a reporter for the ST. LOUIS POST-DISPATCH. Baldwin, a quiet man whose perpetual look of round-eyed incredulity elicits confidence after confidence, was able to find contractors who would cite figures and facts about their experiences.

Restrictive practices by bricklayers resulted in an increase in the cost of brickwork in St. Louis since World War II which was almost 7% higher than the average increase for the rest of the nation.

The rise was blamed for the switch by heavy industry in and around St. Louis from masonry to corrugated asbestos siding, metal wall panels and tilt-up concrete slabs, despite a preference for brick.

In St. Louis, as elsewhere, most union leaders are honest. It's the minority who can damage labor's reputation in a city. And in St. Louis there were the courts for labor leaders charged with offenses other than economic shortsightedness.

• **Who's who**—Paul H. Hulahan, business agent of Local 42, AFL building laborers and hodcarriers union, was first to go to trial of 16 AFL leaders who were indicted last year on charges of violating the federal anti-racketeering law. On Jan. 7, a jury which heard four days of testimony found him guilty in less than two hours.

The case against Hulahan turned on three alleged shakedowns of contractors on jobs in the St. Louis area:

• Conspiring with another union official in an attempt to extort $50,000 in 1951 from M. H. Carpenter, a Los Angeles contractor who headed a firm building a $5-million housing development in north St. Louis County.

• Extorting $400 in 1950 and 1951 from John Farrington, a superintendent for Jones-Hattelsater Construction Co., Inc., of Kansas City. The concern was erecting a storage building for Valier & Spiers Co., a St. Louis flour milling firm.

• Conspiring with two union business agents to extort $1,600 in 1950 from McCarthy-Pohl Construction Co., then contractors for grading operations at municipal airport.

Hulahan, at liberty on $50,000 bond, steadfastly affirmed his innocence.

Both the business agents named as co-conspirators with Hulahan were murdered in 1952.

In their testimony, Carpenter and other witnesses told of being approached with requests for money in return for which labor peace would be insured. John E. McCarthy, vice-president of McCarthy-Pohl, said the company had to obtain an extension of time on the airport job because of work stoppages. The work cost $429,899 more than had been estimated, he said.

The vice-president of the concern which built the structure for Valier & Spiers, Clarence P. Reedy, Kansas City, said the company lost $411,000 on the contract. This was due in considerable measure to "trouble with laborers," he said.

• **Preface**—Pattern of the Hulahan trial disclosures, with their atmosphere of gun-toting business agents, meetings in hotel lobbies and mysteriously controlled strikes, was foreshadowed by events of 1951.

In that year, the Air Force's $24,818,000 program at Scott Air Force Base near Belleville, on the east side in Illinois, was endangered. Few contractors would bid. Those who did admitted they had padded their estimates to meet unpredictable costs. The Army Corps of Engineers rejected first bids as too far out of line.

There was definite evidence that the grip of racketeers on a few key building unions and on several major contractors threatened expansion of private industry and was choking off defense construction in the St. Louis area.

Contractors, particularly on the Illinois side, reported shakedown efforts on jobs which had completion deadlines.

They charged that jurisdictional disputes and slowdowns were dictated if contractors failed to cooperate.

Frazier-Davis Construction Co.,

GUILTY—Paul Hulahan

VICTIM—M. H. Carpenter

contractor on a $5-million gas pipeline, was said to have been approached by a man representing himself as an emissary of a union leader. The contractor refused to make a $50,000 payoff despite threats that the job would cost $500,000 more than estimated.

The project, initiated in May 1950, had an October deadline. Jurisdictional disputes broke out between members of Local 562, AFL steamfitters union, and the AFL hodcarriers and common laborers union. Work stoppages covered a total of 30 work days, and the job cost $500,000 more than estimates, as predicted.

Boss of the steamfitters local then and now is Lawrence Callanan, an ex-convict and one of AFL leaders under indictment on charges of racketeering. He is a power in politics and his brother Thomas, was until recently sheriff of St. Louis.

• **Pattern emerges**—In 1951 disclosures by the POST-DISPATCH, two Chicago contractors reported they withdrew as competitors in the east side construction field after suffering heavy losses on government contracts. They said labor costs on their St. Louis area jobs ran to three and a half times what they would have been around Chicago.

One contractor said he lost $80,000 on a $320,000 federal housing project in Madison County in 1948. The other told of dropping $125,000 on a $622,000 housing job at Scott AFB in 1947.

St. Louis has its share of complaints that out-of-town contractors are discriminated against while certain local ones seem to find labor seas calm.

A specific complaint of discrimination found expression last July when Rowley-Berst Co., a Cincinnati contractor, filed suit for $600,000 damages against Leo F. Havey, business agent of the AFL bricklayers union in St. Louis, the union itself, a St. Louis brick contractor and others.

Rowley-Berst alleged loss of $258,000 on a construction project at Jefferson Barracks VA hospital because of slowdowns and other difficulties. The company charged a conspiracy in restraint of trade.

Havey, prominent in civil and political affairs in St. Louis, is one of the AFL group under federal indictment. He is charged with threatening violence to the Cincinnati concern in a plan to prevent Negro union bricklayers, and other bricklayers living outside the state from being brought there for work.

Following his indictment, Havey resigned as chairman of the Land Clearance for Redevelopment Authority in St. Louis. He served on the St. Louis Housing Authority in 1950-52 and is considered one of the most politically influential labor leaders in the city.

• **The high cost of bricklaying**—Union Electric Co. switched to masonry substitutes after the company took a "terrific beating" in construction of the third section of its Venice power plant on the east side in 1948, an official declared. Workers laid an average of only 200 bricks a day, so that walls cost $7.60 a sq ft.

In consequence Union Electric used substitutes in construction of the Venice plant's fourth section and the new Meramec plant in St. Louis County. The company estimated it saved $580,000 on the two jobs, and bricklayers lost a chance to lay several million bricks.

St. Louis Post Dispatch photos

CIVIC LEADER—Leo Havey

Building trades irked as Eisenhower leans toward state control of labor

A basic tenet of the Eisenhower Administration is that the 48 states should have more control over matters in their interests—that the federal government should retrench its far-flung empire.

This philosophy is being applied to labor relations and the AFL building trades unions complain that it strikes at the heart of their activities.

When President Eisenhower proposed several amendments to the Taft-Hartley Act to satisfy the demands of the construction unions, he proposed—at the same time—that the demands of the states to handle labor matters within their borders be looked into.

He did not, as the unions had hoped, seek to change Taft-Hartley so that the federal law would be supreme over state labor laws. For example, the states can now outlaw the union shop—14 have already done so—even though it is permitted under T-H.

AFL building trades president Richard J. Gray said the White House proposals for the construction industry were "meaningless" unless something was done to prevent the states from invoking "right-to-work" laws that make the union security clause illegal.

Congress is more likely to take some action on extended state control of union activities. So the building trades unions may be worse off—from their standpoint—at the end of the year, despite the Eisenhower stand.

These are the building trades objections to the state "right-to-work" laws:

• They will not permit national agreements with contractors. Those agreements, containing union shop clauses, cannot be extended to the 14 states that outlaw union security.

• They reject the basic claim of construction unions that their members necessarily must be highly trained; that the unions aid in this training; that unskilled (non-union) workers should not be permitted on construction projects.

The Eisenhower amendments would be highly acceptable were it not for the restrictions of state laws. But, a coming report from federal agencies on the states rights issue will not eliminate these restrictions; it is more likely to extend them.

Labor Secretary James Mitchell is promoting the states rights study suggested by the President. Congress is anxiously awaiting the report which will be some months in the making (the inter-agency study committee is just getting organized).

With most state legislatures meeting this year, more "right-to-work" laws will be put forward. These are the states with such laws now on the books:

Alabama, Arizona, Arkansas, Florida, Georgia, Iowa, Nebraska, Nevada, North Carolina, North Dakota, South Dakota, Tennessee, Texas and Virginia.

Skyscraper Plaza is over street, garage and shops.

Mountain Expressway has big bridges, long tunnels.

Public works by the hundreds

Venezuela dedicates 450 different projects designed to raise it standards of transport, education, health and housing, and to aid agriculture and business

Waldo G. Bowman
Editor, Engineering News-Record

For an entire week early last month, cutting ribbons became the principal occupation of the Venezuelan government. In every one of the twenty-two estados of that oil-rich country public officials wielded scissors like French dressmakers, made speeches, paraded and pointed with pride—getting little sleep, but garnering lots of glory.

There was justification for such a spirit of national fiesta. A great public works program, developing over the last five years or so, had been brought to such a stage of completion as to permit the mass dedication of 450 separate projects.

The celebration was also timed to mark the first year in office of the country's development-minded president, Colonel Marcos Perez Jimenez, whose avowed objective is to remove his country from the underdeveloped-nation category at the earliest possible moment. To that end he devoted $227 million (one third of the national budget) to public works last year, and has earmarked $237 million more this year. In addition, sizable sums are being channeled to a National Agrarian Institute whose job is to reclaim jungle land for agriculture and to establish farmer colonies to work it. This is being done in an effort to boost the country's lagging food and livestock output.

Among the 450 public works projects dedicated were a few worthy of world-wide attention as technical achievements, and literally scores of more ordinary jobs each of which made up in local utility what it may have lacked in wider significance. Among the latter were 63 schools, 32 hospitals and clinics, 107 water supplies, 39 electric power plants, 12 public housing projects, 58 public buildings such as city halls, postoffices and markets, several hundred miles of farm-to-market roads and paved city streets, numerous sanitary improvements and several airport and river development schemes.

The big projects were mostly concentrated in the capital city of Caracas and its vicinity. One was a 10.5-mile toll express highway through the mountains linking 3,000-ft-high Caracas with its seashore airport at Maiquetia and its ocean port at La Guaira and costing $60 million.

Another was a business district boulevard tying in with new parkways and other widened streets that reach out into the suburbs.

A third project dedicated was a commercial and government center of buildings—lining five blocks of the new boulevard—that includes two 28-story structures and is underlaid with a parking garage and shopping center as well as with a tunnel that carries through traffic under the development.

Thirteen modern and modernistic buildings of a new University City, a magnificent army officers' club and a new luxury hotel were also in the big project class of newly opened facilities.

•$6 million a mile—The claim is made that the 10.5-mile, $60-million Caracas-La Guaira highway is the most expensive piece of roadbuilding in the world. And the claim is difficult to challenge as for highways in open country.

Few U. S. turnpikes have cost much over $1 million a mile, the principal exception being the 118-mile New Jersey Turnpike at $2.4-million. The 8-mile extension of that turnpike to the Holland Tunnel is estimated to cost $13 million a mile, but this will be in an area of high land values and will include a bridge over Newark Bay, and costly interchanges.

From the standpoint of cost, the Venezuela road is indeed a remarkable project.

It is likewise a notable technical and construction achievement. Rising 3,000 ft in 10.5 miles, it is built in every respect to modern expressway standards. Its two 24-ft asphaltic concrete roadways are separated by a

Luxury Hotel like an Inca pyramid bent around dining terraces and swimming pool, its 400 rooms are usually shaded.

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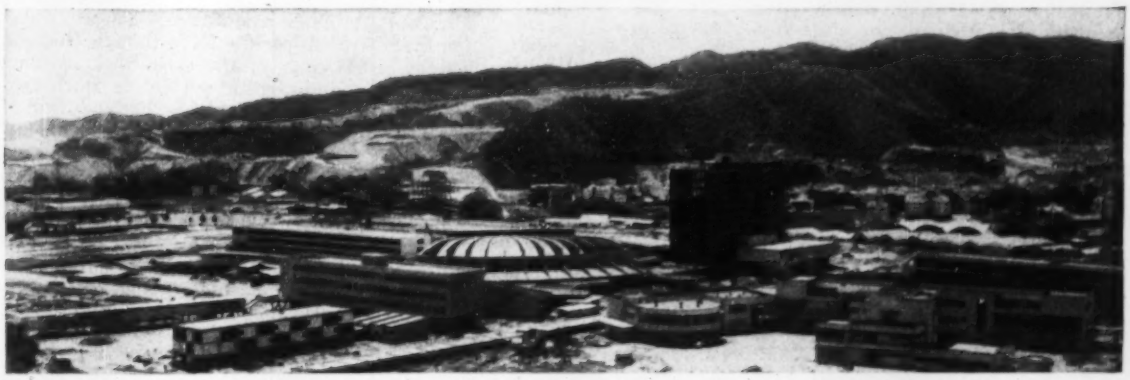
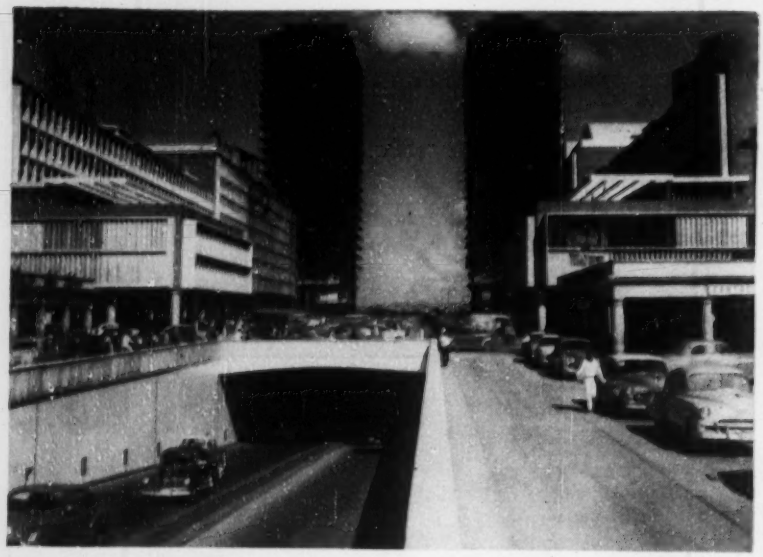
School provides modern facilities for 1,200 pupils.



University City of 35 buildings features circular auditorium and tall library. Two large stadiums are at far left.

TUNNEL PORTAL on new Caracas-to-the-sea toll road is ventilation building for the twin tubes housing first axial-flow fans used in a major vehicle tunnel.



AVENIDA BOLIVAR drops below the new central business district buildings to emerge beyond the skyscrapers and the great plaza pictured at the head of the article.

4-ft center island under which telephone and electric conduits are installed and on which rest the lighting standards whose mercury vapor lamps illuminate the highway for its full length. There is a 5-ft stabilized shoulder on the mountain side of sidehill cuts, and 8-ft shoulders elsewhere, lined at danger points with a 2½-ft. guard wall. The right-of-way extends for 250 ft on both sides of the road, and is being landscaped.

Since this new road cuts through mountains in a relatively straight line—it has only 36 curves as compared with 360 on the old road, which wound its way for 18 miles up and down a 6,000-ft ridge—tunnels, bridges, deep cuts and high fills were among its construction features. Two tunnels are required, each a twin-bore to separate opposing traffic. Excavated in rock, they are 5,900 and 1,560 ft long respectively. The bores are horseshoe shaped, 29 ft between inside of vertical walls and 20 ft high from crown of road to intrados. The concrete ceiling, above which is the fresh air duct, is 14 ft above the roadway.

The tunnels are lined with 2 in. of concrete, and the entire inner surface is painted white to reflect the light from two continuous lines of fluorescent tubes on either side. Fresh air supplied by axial-flow fans in the blower buildings, which form the portals of the tunnels, is introduced through slits in the ceiling and is exhausted through the portals by the piston action of the traffic.

In addition, in the upgrade bore of the longer tunnel, horizontal drifts are provided to the open air at the third points of the tunnel length. Exhaust fans in one of these and blowers in the other supplement the portal openings and reduce the size and length of ducts to practicable limits. Full-face drilling and shooting was used to construct the tunnels, which required 900,000 cu yd of excavation.

Because grades are limited to 6%, cuts and fills of extraordinary size had to be used. Thirteen fills range from 78 to 141 ft high, and the maximum cut is 300 ft deep and 900 ft long.

The bridges are in keeping with the other spectacular features of the project. Built of prestressed concrete, they set world's records for this type of construction. Each bridge—there are three of them—contains an open-spandrel concrete arch flanked with viaduct approaches. The arch spans are 498, 476 and 453 ft respectively, in bridges that have overall lengths of 1,013, 830 and 700 ft. The arches were constructed on cable-supported formwork since the highest of them is 220 ft above the valley floor. The design and construction of these unusual structures were described in Engineering News-Record, Sept. 11, 1952, p. 28.

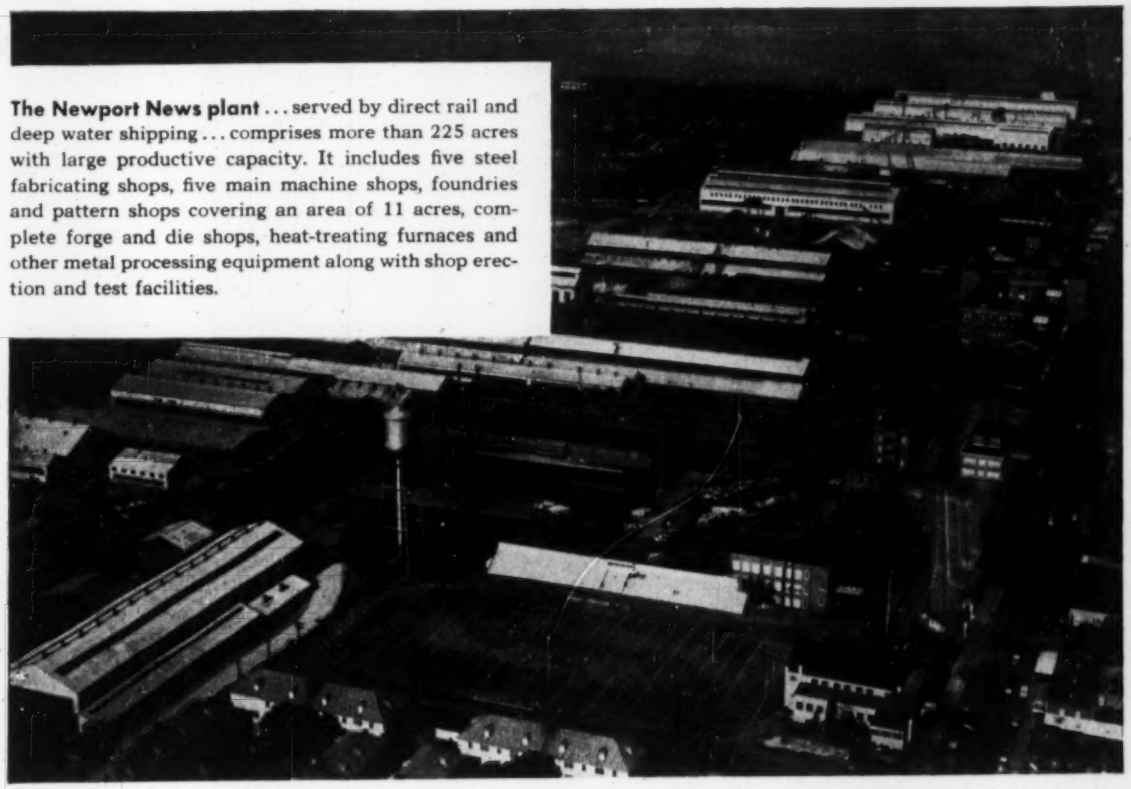
Of the total cost of the road, about $23 million went into the tunnels and $5.5 million into the bridges, with the remaining $32 million going to the other facilities. The design and construction work was under the supervision of the Venezuela Ministry of Public Works.

Venezuelan contractors handled all of the work except the tunnels and bridges. The latter were built by the French firm of Campenon-Bernard to designs by Eugene Freyssinet. The tunnels were constructed by Morrison-Knudsen Inc., Boise, Idaho. Smillie and Griffin, New York, were consultants on design.

The Caracas-LaGuaira highway is a toll road; with rates set at a level so that traffic of 6,000 vehicles a day will amortize the cost in 20 years. The old free road probably will remain available to traffic, but since its driving time is an hour compared with 20 minutes on the new highway (where speeds of 50 mph in the fast lane and 35 mph in the slow truck lane are permissible) it will not be much used except for those who like the thrill of mountain driving.

• **New boulevards in Caracas**—Bringing traffic into Caracas faster and in greater volume—as the toll highway will do—pointed up the need for a system of new boulevards in the city itself, where traffic congestion already rivaled the worst in the world.

Such a system is well along toward completion, and important new units were dedicated last month. Among these is a parkway following in gen-



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eral the course of the Guaire River in the narrow east-west valley in which the city is located. The river itself was dredged, straightened and confined in paved and sodded banks over a distance of 2¼ miles. To the eastward, the parkway is called the Autopista del Este—the western half goes by the name of Avenida Guzman Blanco.

The Autopista del Este is 3½ miles long and 71 ft wide with a dividing island in the center. It crosses the river twice and, in addition, includes four overpasses at major intersections. One of these gives access to the new University City and to the city's two athletic stadiums while another connects with the section in which the new hotel is located.

The Avenida Guzman Blanco is also 3½ miles long but only 36 ft wide. It provides a new high speed exit from the city westward, and in so doing serves the race track, previously the scene of prolonged traffic jams.

Two other widened and modernized boulevards—the Avenida Roosevelt to the southwest and the Avenida Abraham Lincoln roughly paralleling the Autopista del Este—were opened within the last year.

In this modernized class also is the Avenida Sucre opened ten months ago to be ready to bring traffic from the end of the toll highway at the northwest corner of the city down into the business district. This new boulevard would have compounded an already bad traffic situation had not still another traffic relief project—and the greatest of all—been undertaken. This is the Avenida Bolivar, dedicated last month, which cuts an east-west swath directly through the central business district of the city, connecting with the Avenida Sucre and providing access to the Autopista del Este.

• **Transformed district**—Actually the Avenida Bolivar was not planned solely as a traffic relief route, but as an urban development project that would open up and transform the whole central district of the city. To this end a strip 500 ft wide and slightly over a mile long was cleared of old 16th century buildings and narrow streets. The new 8-lane boulevard was placed in the center of this strip, and plans were drawn to line it with modern office buildings and apartments.

The boulevard is complete, forming what is described as a new backbone for the city, and buildings are completed or under way along the first quarter mile at the west end. Mostly from 4 to 8 stories in height, this initial group is highlighted by a pair of 28-story skyscrapers, by far the tallest in the city. All buildings are interconnected, the two lines of structures on either side of the boulevard by subterranean passageways bordered by shops.

Because these new buildings will generate an even greater concentration of population in the business district, means had to be found to move its traffic efficiently. This is accomplished by depressing the four lanes of fast, through traffic on the boulevard into an underpass that extends for 1,150 ft under the surface street. Local traffic at ground level passes in front of the buildings, with opposing lanes separated by a wide grassed plot, and with other planted areas along the curbs. This ground level roadway passes around the two skyscrapers to rejoin the Avenida Bolivar and the traffic from the underpass farther west.

The boulevard underpass, in addition to providing for through traffic gives access to a central underground bus station for 600 buses and to an underground garage that will accommodate 1,600 cars. At a still deeper level another underpass carries cross-traffic from side streets in a diagonal direction under the development.

One other feature of the project is worthy of emphasis—a great pedestrian plaza on two levels adjoining the east side of the skyscrapers and spanning the boulevard where it emerges from the underpass. The plaza is in effect a great balcony, which will be landscaped like a park and afford a view down the boulevard and over the city to the mountains beyond.

When completed with 24 buildings lining its route, the Avenida Bolivar project will have cost $300,000,000. It is being financed by a special company—jointly owned by the Government Bank Obrero, the Venezuelan Development Corp and the city of Caracas—which has issued bonds secured by rents on the buildings to raise its capital.

• **University buildings**—Gradually taking shape over the last eight years an entirely new University of Caracas was also far enough along last month for thirteen new buildings to be dedicated. Prominent among them was a 13-story library and a great circular, domed auditorium, and included were numerous 3- and 4-story rectangular structures for classrooms and dormitories.

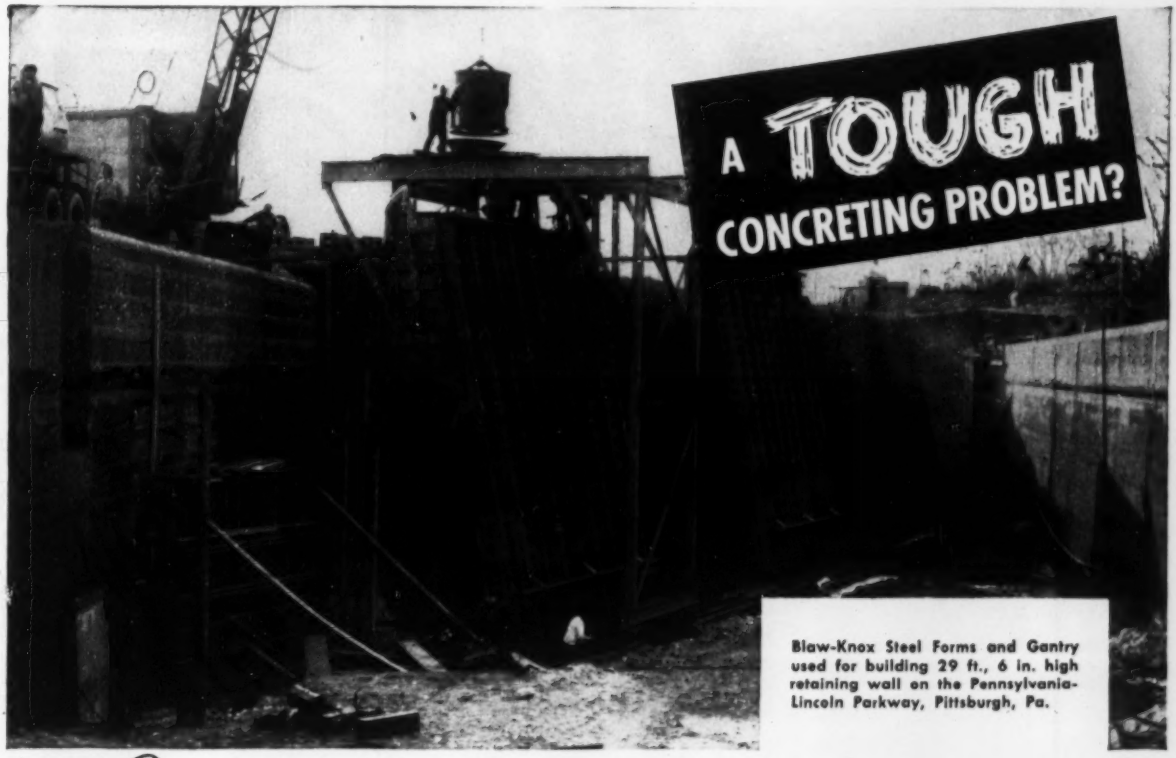
Located on a 370-acre campus, the university will be composed of about 35 different buildings of which 25 are completed and 7 under construction. The buildings will be arranged in groups—medical, engineering, administrative, etc. There will be seven buildings in the engineering group, 4 complete and 3 under way, and included in the medical group is the completed 11-story, 1,250-bed Clinical Hospital. Athletic facilities are concentrated on the west end of the site adjacent to two new city stadiums, which seat 35,000 and 40,000 persons respectively.

The library building is unusual in that its concrete frame is left exposed as an architectural detail. It is windowless for the first seven stories and in parts of the remaining six stories. All curtain walls are of concrete block painted red to contrast with the white frame.

Radial rigid frames comprise the framework of the 135-ft diameter auditorium. Each frame is in effect a cantilever, a steel rod outside of the building tying back to an anchorage. Cantilever canopies around the building also cover part of a plaza which forms the core of the central group of buildings. Architecture tends toward modernistic lines, and all buildings are of reinforced concrete. Carlos Raul Villanueva is the architect and Luis R. Domiani the construction engineer for University City.

• **Luxury living**—Completing the series of large projects in Caracas dedicated last month by the President are an army officers club and a 400-room commercial-resort hotel. The club, a series of interconnected apartments, lounges, ball rooms, patios, swimming pools, a 450-seat theater and other recreational facilities is probably the most magnificent layout of its kind in the world. In sheer luxury it exceeds even the hotel, itself designed to provide the best in all kinds of accommodations.

The new Hotel Tamanaco is also a design and construction achievement of note. Set on a bench carved into the mountainside by 200,000 cu yd of excavation, the hotel is arranged in the shape of a broad V to obtain as many hours of shade as possible for the maximum number of rooms. The ends of the building are stepped to provide terraces for large suites while at the same time imparting an "Inca pyramid" appearance to the structure. Dining terraces, gardens and a swimming pool are grouped in the angle of the V to make a compact arrangement of the whole, and to provide for a maximum of outdoor living. The building is of reinforced concrete, and cost about $8 million dollars. Financed half by the Venezuelan government, one quarter by private local interests and one quarter by the U.S. Export-Import Bank, it will be operated by the Intercontinental Hotels Corp, wholly owned subsidiary of Pan American Airways. Gustavo Guinard of Caracas was the architect and Holabird & Root & Burgee of Chicago, associate architect. Officiana Tecnica Gutierrez & Co, Caracas, was the contractor.



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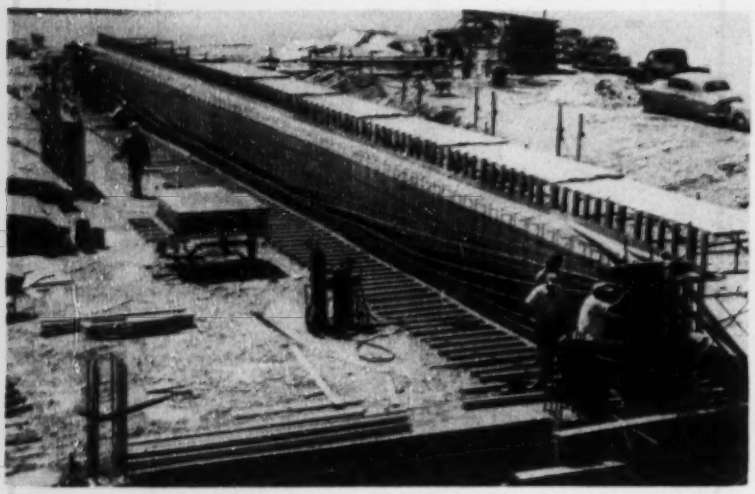
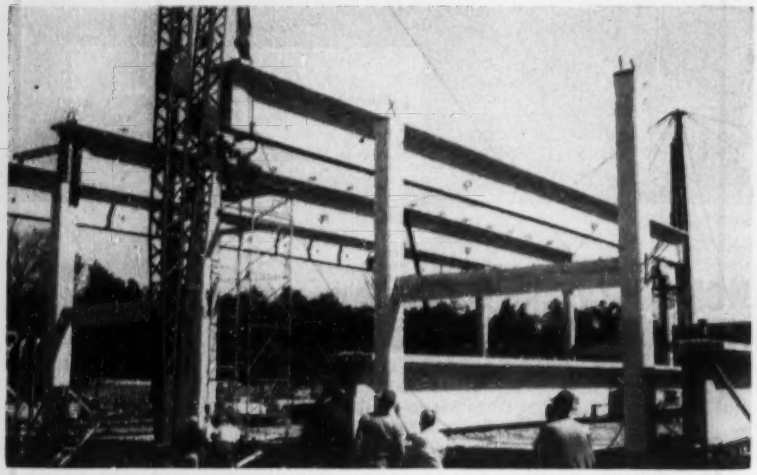
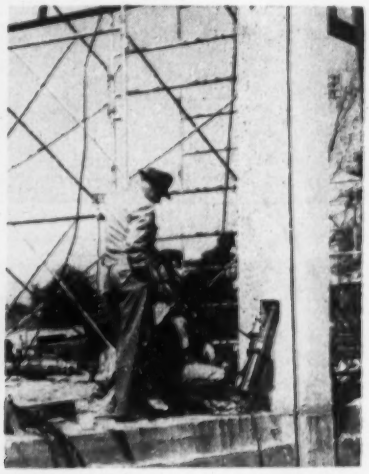


120-ft girders Prestressed roof girders with 120-ft span were precast in plywood forms for a gymnasium in Greensboro, N. C. Stirrups, inserts and prestressing wires were positioned with only one side form in place.



ERECTION of the 120-ft girders was accomplished with guy derricks. Prestressing cables in the columns were passed through the girders to anchor them.



PRESTRESS was applied to the tie-down cables in each column.

Prestressed roof girders set span record

William D. Shea
Chief Engineer
Arnold Stone Co.
Greensboro, N. C.

The longest span prestressed concrete girders to be used to date in building construction in the U. S. have been erected for the Senior High School gymnasium in Greensboro, N. C. The girders span 120 ft.

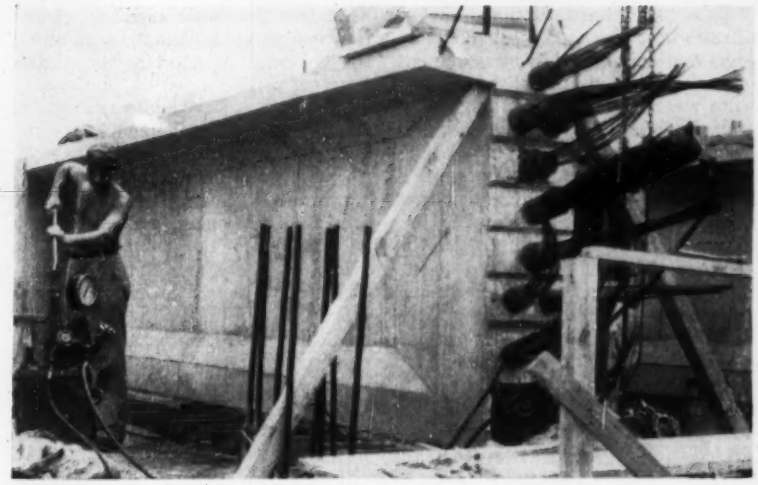
Precast on the gymnasium floor and prestressed with steel wires anchored at the ends of the members, the members are a modified T-shape in cross section, 73 in. deep. Each girder weighs 63 tons.

[EDITOR'S NOTE—The record span at Greensboro is 26 ft longer than that for the cast-in-place prestressed roof beams over the Bishop DuBourg Catholic High School gymnasium in St. Louis, Mo. (ENR Nov. 19, 1953, p. 29). However, longer girder spans have been used abroad. Prestressed beams span 168 ft, for example, in the roof of a hangar at Melsbrock, Belgium (ENR Feb. 10, 1949, p. 18). These hollow, trapezoidal members with 6-in. thick walls are 9½ ft deep and weigh 300 tons.]

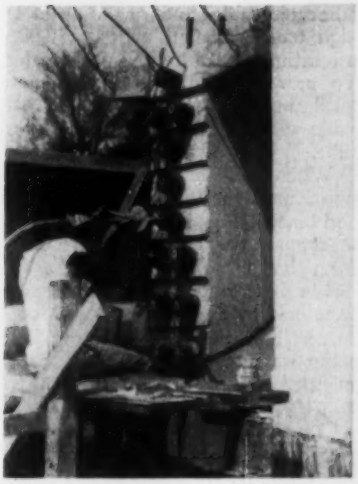
• **Alternate designs bid**—Before a contract was let for the Greensboro gymnasium project, the architects made cost studies for prestressed concrete girders and rigid-frame steel construction. These indicated that prestressing would be less expensive. So the architects started to design for prestressed concrete. Before they could complete the working drawings, however, the prestressed concrete design was made an issue at a meeting of the school board. The dispute led to inclusion of an alternate design with steel trusses. Finally, when bids were received, the low bidders priced the steel alternate $10,000 higher than the prestressed concrete design.

With prestressed concrete, the gymnasium cost $348,500 to construct—$8.50 per sq ft of floor area, $0.44 per cu ft. The general contract was awarded for a low bid of close to $281,000; plumbing, $14,000; heating, $28,000; electrical, $15,000; and the architectural contract, $10,150.

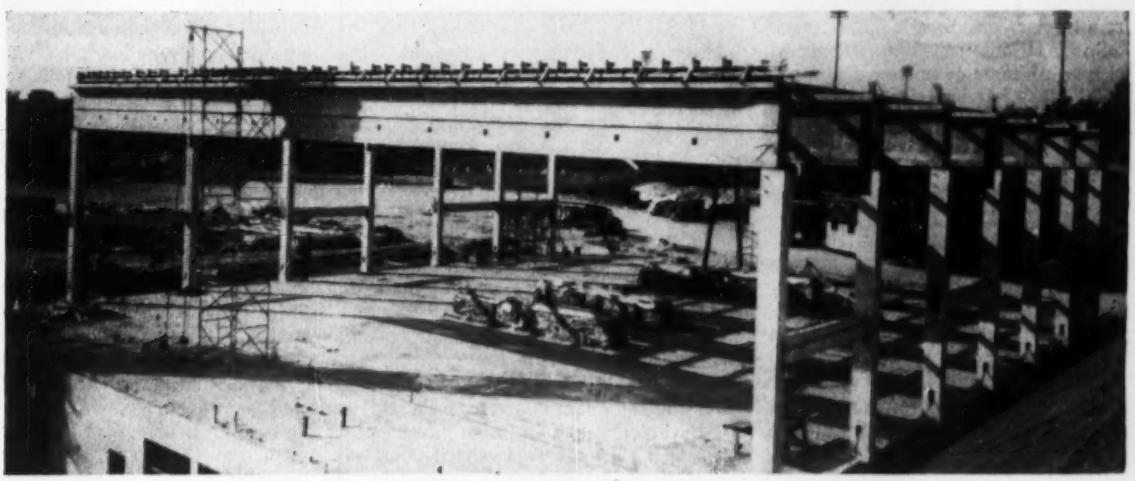
• **Facilities included**—The building is 161 ft square. In the center, at entrance level, is a 118-ft square playing floor. This area is surrounded by a



HYDRAULIC JACK tensioned the cables after the concrete gained sufficient strength. Each cable was anchored at girder ends with conical wedges.



GROUTING the wires under pressure followed to establish bond.



In place Gymnasium spanned by the prestressed girders will have a playing floor 118 ft square unobstructed by columns. The girders will support precast concrete joists, which in turn will carry precast channel-shape deck units.

two-story section, with offices, concessions, toilets, locker rooms and storage space on the first floor. A balcony with a running track surrounds the central core and can be reached by stairways at each corner of the building.

Folding bleachers on the sides of the playing floor and in the balcony make seating available for about 3,500 persons. With additional seating on balcony ends, it is possible to accommodate 5,000.

The building exterior is brick with limestone trim. Windows and doors are built of steel. Interior finish includes exposed brick walls with terrazzo floors in public spaces. Toilets and locker rooms have glazed structural tile walls, and toilets and showers have ceramic tile floors. The playing floor, built over a crawl space, is concrete finished with Michigan hard maple.

• **Girders precast**—The roof over the playing floor is carried on seven 120-ft prestressed, precast concrete girders, spaced 20 ft apart. The two exterior prestressed girders form a clerestory above the lower roof of the two-story section. Elsewhere, reinforced concrete construction was used.

The prestressed roof girders were precast on the playing floor alongside the 18x24-in. concrete columns that were cast in place to support them. To prevent overloading the floor, the casting beds were located adjacent to floor beams. For additional support, shores were placed in the crawl space between these beams and the ground.

• **Few forms needed**—A single set of ⅝-in. thick plywood side forms was used for all seven girders. Assembled from sections 8 ft long, these forms were braced at 12-in. intervals with 2x4 studs.

The side forms were set against soffits made of 2-in. thick planks. This was supported on 4x4-in. cross pieces, to keep the form bottom off the floor. Only three sets of soffit forms were needed, because they could be removed easily for re-use when the prestressing forces deflected the girders upward.

The forms produced a 73-in. deep, T-shape member, with 48-in.-wide top flange and 8-in. web. The web for its full length was thickened to 18 in. at the bottom. It also was thickened to 18 in. for its full depth over a short distance at both ends of the girder. This was done to provide the required area for bearing where the prestressing steel is anchored, and to distribute the stresses over the cross section.

To simplify placing of prestressing and stirrup steel, bearing plates, inserts for lifting the girder and dowels for anchoring joists, these items were installed with only one side form in position.

Prestressing steel consists of 12 pre-

fabricated cables, each made up of 18 high tensile strength wires (250,000-psi ultimate) 0.196 in. in diameter. To prevent bond with the concrete until the wires were tensioned, each cable was enclosed in a flexible metal tube.

When the second side form was positioned, the two sides were tied and braced. For this purpose, one row of snap ties was used at mid-height; form bottoms were secured to the 4x4-in. base cross pieces, and the tops were held by 2x4's that served as both spacers and ties. Though this form setup was very rigid, it could be dismantled easily and reset.

• **Concreting operation**—To place concrete in the form, an elevated runway was erected level with the top of the form along one side. The runway was connected by a ramp to a lower platform where concrete was dumped from truck mixers directly into buggies.

Specifications called for concrete with an ultimate compressive strength in 28 days of at least 5,000 psi. This was met with a 1:1.5:2.4 mix containing 8 bags of high-early-strength cement per cubic yard and having a water-cement ratio of 0.48. Maximum size aggregate was ¾ in. Slump was specified as 2½ in. maximum and was uniformly maintained by a conscientious and cooperative concrete supplier.

Casting started at one end of a girder, where concrete was placed to the full depth of the form. From there on, concrete filled the forms as casting progressed down the length of the girder.

Internal vibrators were used for compaction. For the first three girders, these machines were supplemented with two external vibrators, one on each side of the form. However, for the last four girders, the external vibrators were abandoned because they appeared to offer little benefit.

Side forms were stripped early the next day and reset for another girder. Early stripping of these forms was considered advisable to permit escape of the heat of hydration of the high-early-strength cement. Immediately after removal of the forms, wet curing began—by covering the concrete with burlap and then spraying down with water.

• **Tensioning the cables**—Prestressing was permitted when the concrete developed a strength of 4,500 psi—usually within six days after casting. Conical wedge anchors were attached to all cable ends. Then, starting with the top cable, each was stressed in succession.

Tension was applied to both ends of a cable simultaneously with a pair of jacks to minimize frictional effects. Stresses were checked both by pressure gages on the jacks and by measurement of steel elongation. Initial stress in the wires was 175,000 psi (working stress, after losses due to various causes, is assumed to be 150,000 psi). Under this condition, specifications permitted an initial compression in the concrete of 2,250 psi and tension of 225 psi. However, under working loads, the concrete was to be subjected to no more than 2,000 psi in compression, no tension due to bending and a maximum diagonal tension of 100 psi.

As the prestressed was applied, the bottom of the girder rested against the soffit form until the sixth cable was tensioned. After that the girder deflected upward until, after the last cable was stressed, it attained a maximum deflection of 1⅜ in. at midspan. Since a 2-in. camber was built into the forms, the girders had a total camber of 3⅜ in.

In applying the prestress to a cable, the jacks, with the wires attached to them with steel wedges, acted against the ends of the girders. When the proper stress was obtained, a second action of the jack drove home the conical wedge to anchor the wires.

Then, cement grout was injected under pressure through a small hole in the male wedge until it squirted freely from a similar hole at the other end of the girder. This assured the complete filling of the tube enclosing the cable. Purpose of the grouting was to establish bond between the wires and the girder concrete, protecting the steel against corrosion and increasing its ultimate-load capacity.

Actual working time for completing a girder was six days. Average elapsed time allowing for bad weather, Sundays and unanticipated delays, however, was about nine days.

• **Fast erection**—The 63-ton girders were erected with a guy derrick at each end, positioned to assure a vertical lift. Actual lifting time from floor to top of the 24-ft high columns took about 1½ min. About 10 min. more were consumed in setting the girders on their bearing plates. To assist this operation, a light steel channel section, temporarily bolted to and extending above each column, served as a guide.

The girders were tied to their columns with tensioned cables. Enclosed in flexible metal tubing to prevent bond with the concrete prior to tensioning, two 12-wire cables were embedded in each column for this purpose. They were anchored near the bottom of the columns and at the top of the girders.

These cables were passed through holes near the ends of the girders while those members were held against the channel guides about 12 in. above the columns. As soon as the girders were set down, a partial prestress of 12,000 lb was jacked into each cable, which then was anchored temporarily with conical wedges.

The bearing on top of the columns was formed with two steel plates. One is a 6-in. wide plate embedded flush with the top of the column with long axis along the center line of bearing. The second, only 2 in. wide, was centered on top of the first plate and supported the girder weight until roof construction was completed. Because of the narrowness of the top plate, the girders could be assumed to act as simply supported beams under dead load.

Later, the spaces between columns and girders were packed with a stiff grout. When the grout hardened, column cables were fully prestressed, to produce a rigid connection for resisting live lloads and wind. The prestress imparted to the columns reduced to a small amount the reinforcing steel needed for bending stresses in the vertical members.

• **Completing the roof**—Major steps remaining for completion of the roof framing following erection of the girders included:

1. A 10-in. thick spandrel beam, or fascia, the same depth of the girders was cast in place at the top of the columns. Embedding the ends of the girders, it braced those members and protected the anchorages.

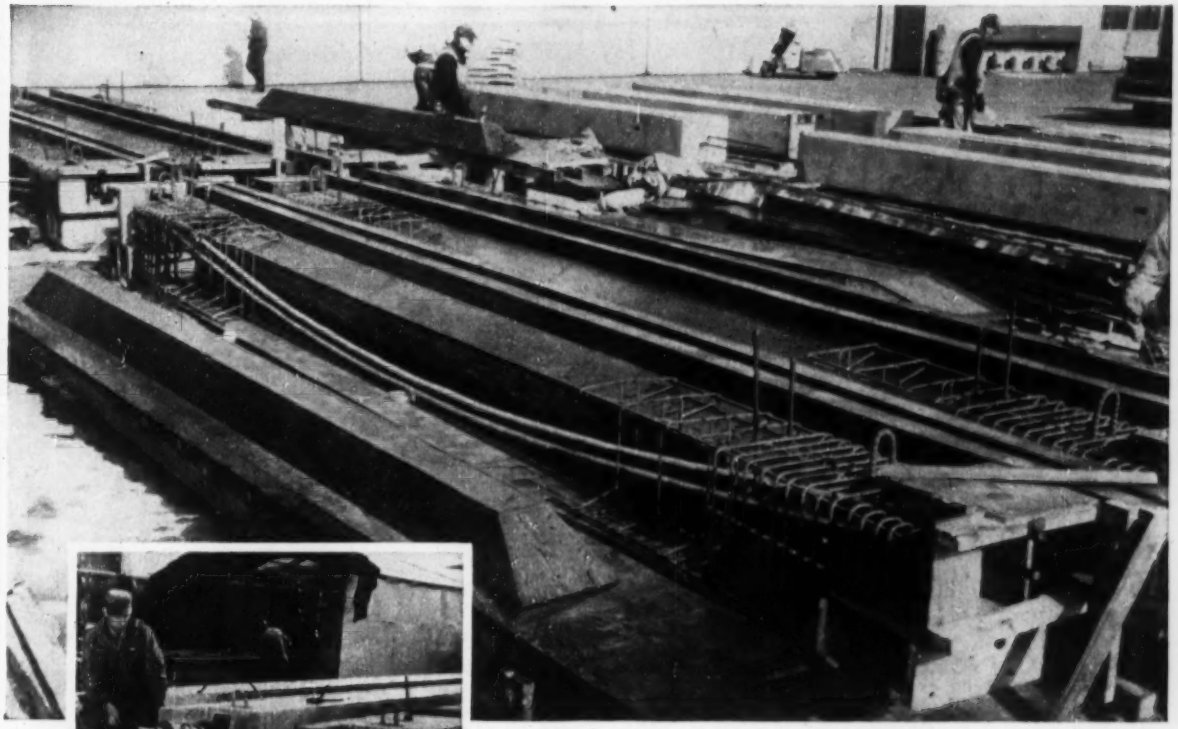
2. I-shape joists of precast concrete were erected on the top flanges of the girders. To brace these flanges, joist reinforcing steel was welded to dowels embedded in the girder tops. Lower flanges of the girders were braced at third points with precast concrete struts.

3. Precast channel-shape units were placed to deck over the 8 ft between joists. An accoustical insulating membrane had been cast integrally with the deck slabs.

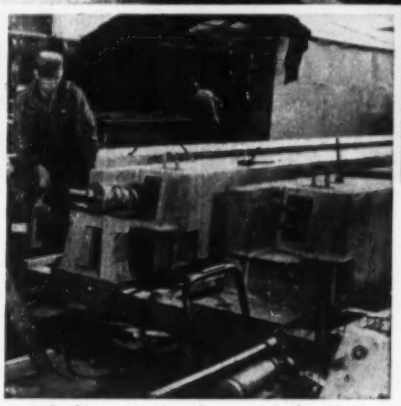
• **Designers and builders**—McMinn & Norfleet, of Greensboro, N. C., were architects for the Senior High School gymnasium. The Freyssinet Co., of New York City, was consultant on the roof design and construction. Work was carried out under the general supervision of Ben L. Smith, superintendent of the Greensboro School Board.

L. B. Gallimore Co., of Greensboro, was the general contractor, with A. J. Hewett as general manager. Arnold Stone Co., of the same city, was the prestressing subcontractor. F. D. Lewis & Son supplied the truck-mixed concrete.

Prestressed concrete construction can increase strength, cut dead weight, save materials, allow longer spans . . .



Stressteel Bars placed in forms prior to pouring concrete. Glenn L. Martin Co. Plant, Baltimore, Md.



Jacking operation after concrete has set.

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Pictures of the month . . . by LeTourneau-Westinghouse

HAULS ON CITY STREETS — C Tournapulls often drive through city traffic on their way from job to job. This unit, owned by Skousen-Hise Construction Company, Albuquerque, traveled 190 miles to Farmington, New Mexico, at road speeds of 30 to 35 mph. The 16-yd "C" also works on city streets. Here, on a road widening job, it is hauling 11 pay yards of sand clay 3 blocks through the center of Farmington. Complete cycle takes 4 minutes. Says Operator C. R. Hendrickson, "I travel continuously at a high rate of speed through heavy traffic, yet (with unit's 4-wheel air brakes) can still stop without trouble at stop signs or to avoid accidents."

1 DOES WORK OF 3 — Repairing washout of a North Dakota road, 7-yd D Tournapull and its one operator handle complete job alone. Self-loading, "D" picks up 5 to 7 loose yds from backslope . . . spreads over soft fill . . . dozes into low spots to raise roadbed above flood level. Average output, 100 yds hourly. Similar job nearby took 3 men and 3 crawlers — one for push-loading, one to pull 18-yd scraper, one for dozing fill.

ROLLING GIVES 5½-MIN CYCLE — To take full advantage of their C Tournapulls' 30 mph speeds, Yerrington Constr Co, Parkville, Missouri, rolls, grades and sprinkles haul roads. This careful maintenance pays off always. On this relocation of Rt 32 between Kansas City and Lawrence — good haul roads helped each of their 3 Tournapulls average a 4000-ft cycle every 5½ min.

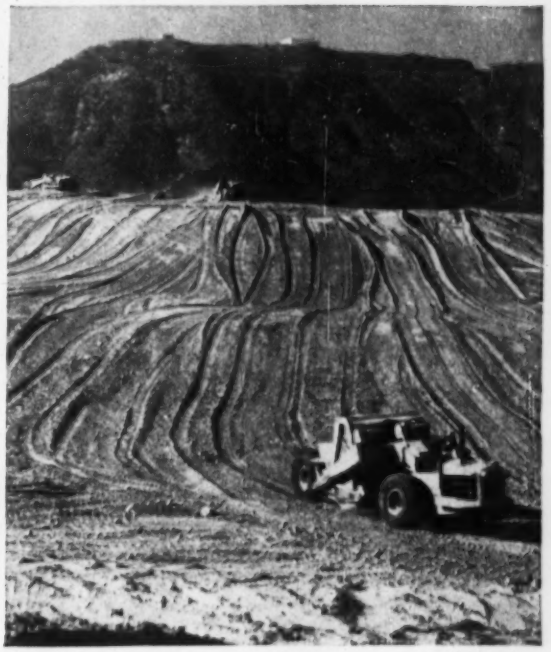
DOUBLE-DUTY — Vernie Jarl, Gresham, Oregon, by interchanging 18-ton Scraper and Rear-Dump trailing units, works his 4 C Tournapull prime-movers efficiently on both rock and dirt jobs. About Scrapers, Owner Jarl says, "They move dirt cheaper than tractors on any length haul." About Rear-Dumps, his Superintendent, Art Bolder, says, "They're the only rigs that work efficiently in the tight quarters we have here."

(Advertisement)

. . . with performance reports from around the world

5 YEARS, "NEVER FAILED" — Production is high, downtime low on this Tournatractor owned by Miss. State Highway Dept. Unit delivers sand for 770 tons of asphalt daily on dozing cycles of 600 to 1200 ft. Five years old, it still has 2 of original tires. Says Shop Foreman H. B. Lee, "A lot depends on continuous operation of our Tournatractor. It has never failed us."

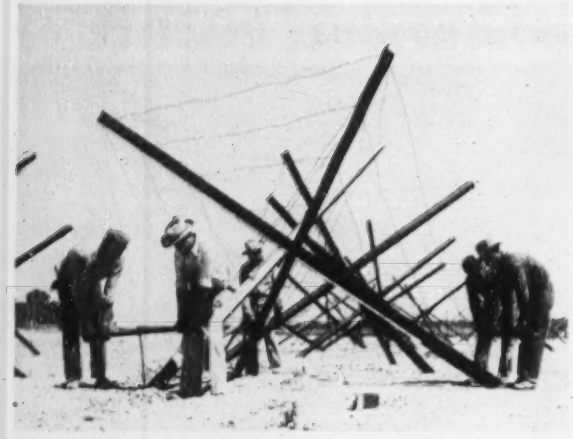
4 MILES FROM ARCTIC CIRCLE — At Jumisko, Finland, 6 Tournarockers are hauling 400,000 yds of granite to excavate 4 miles of tunnels for water power. Winter temperatures drop to 40° below, but units operate 24 hours a day. With 13 ft 9 in. turn radius, they maneuver easily in the 20 ft tunnels.



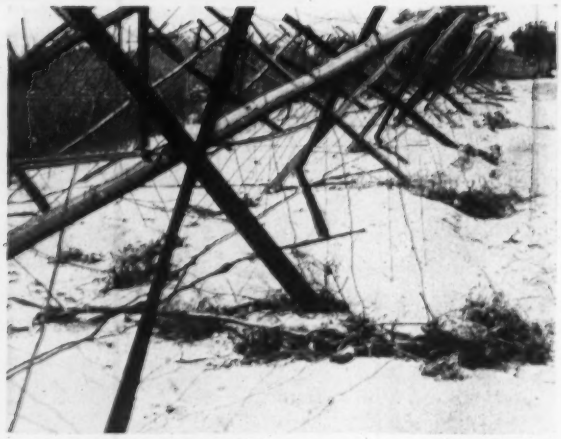
2250', 4.7 MIN — Malcolm Paving Company's 5 C Tournapulls traveled fast down 23% grades to level 192,000 yds for a cemetery addition. Complete 2250 ft cycle took 4.7 minutes. Contractor estimates each Tournapull hauled 10 pay yds of volcanic sand per load, delivered 10 loads per hour, 1000 pay yds per day.

IN A SEA OF MUD — This material being used to build a 115,000-yd bridge approach at Pass Christian, Mississippi is so sticky that trucks sometimes have to be unloaded by hand. Units on job include 5 crawler-tractors ranging from 48 to 163 hp, plus a 186 hp Tournatractor. Dozing fill and grading the roadway, this rubber-tired tractor works so well that R. J. Noland, Job Supt for Southern Foundation Contracting Company of New Orleans, declares "Tournatractor will move twice as much dirt as any crawler equipment." For more information on Tournatractor and other tools shown on these pages, write LeTourneau-Westinghouse Company, Peoria, Ill.

Tournarocker, Tournapull—Trademark Reg. U.S. Pat. Off. Tournatractor—Trademark Plc-556-C



RESEMBLING A JACKSTONE, jetty unit is brought to place, complete with wires strung to connect the assembled arms. Wire ropes tying the units together will be installed later.



SILT AGGRADATION one foot deep was left after first flooding of jetty on Rio Grande near Sandia Pueblo, N. M. Note ¾-in. wire ropes tying jacks together at their centers.

Jack-type jetties protect levees

Work has been completed along the Rio Grande in New Mexico on one of the largest contracts ever awarded for installation of jack-type jetties called Kellner jetties.

Jackson Construction Co. of Rocky Ford, Colo., contractor for the Army Engineers, installed the network of giant steel jacks, wire and cable at seven points along a 65-mi stretch of the river above and below Albuquerque to protect flood control levees against scouring by the restless stream.

A study of this type of jetty was published last summer by the Albuquerque Army Engineer District Office under the title: "Report on Measures for Bank Protection: use of Kellner Jetties on Alluvial Streams."

The Kellner jetty is a patented system of permeable bank protection, to which the Army Engineer report ascribed these advantages: installation costs comparable with or cheaper than other forms, simple installation, and lower maintenance costs.

Army Engineers consider the jetty has proved itself an effective means of stabilizing erodable banks in the silt-bearing streams of the Southwest by forcing the stream to build its own protection for banks and levees instead of scouring them into destruction. The system, according to the report, is flexible enough to retain much of its protective value when undermined by scour.

• **Resembles jackstone**—Structural unit of the Kellner jetty system is a steel jack, so called because of its resemblance to a child's jackstone. The jack consists of three 16-ft lengths of angle steel (4 in. x 4 in. x 16 ft) bolted together at their centers so that each member is at right angles to the other two. The six arms of the resulting big jack form the rigid base of three intersecting planes having a common point at the center of the jack. The planes are developed by interlacing the arms with No. 6 wire. Strands of the wire web connect to each arm at four places.

Jacks are installed in long lines along the area to be protected. When they are spaced 12 ft 6 in., center to center, the spacing of the wire network is uniform through a line of several jacks. Lines are fastened together by threading two ¾-in. steel cables along the line. Cables pass on either side of the center so that jack is firmly held. Cables are anchored at the end of the line to deadmen, usually standard creosoted 6 in. x 8 in. x 8 ft railroad ties buried 4 ft in firm soil.

The Kellner jetty installation is most successful when the line conforms to the existing condition of the river, the Corps of Engineers reports. It works best on the concave bank of a curve in the stream and the jetty line is designed to follow generally the line of the stream. A typical jetty array has two main parts: diversion lines and back-up retard lines. Both phrases refer to lines of Kellner jacks, laced with wire and strung together with anchored cables.

Diversion lines (or mainline jetties) are long lines of jacks placed on the streamward side of the area to be protected. They follow the existing curve of the stream but are usually installed in such a way as to modify the curve in a desired direction. The usual modification is to shorten or straighten the curve. Diversion lines may be one, two or three parallel lines of jacks. They extend above and below the area of bank or levee to be protected so as to prevent outflanking. At either end of the line the two cables become anchor lines, angling toward the bank where they are connected to deadmen.

Back-up retard lines run from the diversion lines back to the bank or jetty to be protected and are usually anchored in the bank or levee. Where the diversion line runs close to the bank, the backup line will be short. Where a considerable portion of a deep curve of the stream is to be cut off and straightened, back-up lines may contain 30 or 40 jacks (350 to 500 ft long). Back-up lines are stretched at an angle to the diversion line (often 45 deg) anchored on the bank at a point upstream from where they connect to the diversion line. Angle and spacing of back-up retard lines depend on the angle at which stream flow attacks the front line of the jetty. If the angle of stream attack is slight, fewer back-up lines are needed. Optimum angle of stream attack is 20 deg. Angle of stream attack also determines the number of lines of jacks in the diversion line, more being needed if the angle is large.

With the jetty array in place, engineers are ready for the sudden, heavy flows which a cloudburst can dump into southwestern streams, or for heavy spring runoff. During a period of heavy flow, water cuts through the jetty lines into the protected area. Slowed by the jack and wire network, the water drops its silt in the jetty field. Future flows will drop more silt and the river gradually builds the necessary bank or levee protection behind the diversion line. Vegetation, which reaches satisfactory growth in two or three years, stabilizes the new aggradation and itself forms a permeable barrier to slow future flood waters in their attack on the original bank. Studies by the engineers indicate that about one foot of aggradation per year can

be expected under average conditions until the newly built up land reaches the flood-stage high-water mark. An extremely heavy flow, however, can leave as much as 3 ft of aggradation.

Kellner jetties are manufactured by Kellner Jetties Co. of Topeka, Kan. The firm was founded by the late H. F. Kellner in the early 1920's. Kellner started his experiments with low-cost, permeable bank protection on small streams in the Topeka area. In the corps' study it is reported that his original jetty unit consisted of three willow poles tied together at the midpoint and laced with wire.

The recently completed project on the Rio Grande involved a total of 5,712 Kellner jacks, installed at seven locations on the river from Santo Domingo, 40 mi north of Albuquerque, to a point below Los Lunas, 25-mi south of Albuquerque. Contract amount was $405,687.

At Chical, a mile south of Isleta Pueblo, a mile-long pilot channel, 100 ft wide, was cut to lead the river in a new direction. Behind the channel a 1½-mi-long training levee was thrown up. Kellner jetties were installed in front of the new levee at the point where the original channel of the river attacks it. Thus, the river has been straightened and 3 mi of curving streambed eliminated. With the exception of the Chical dirt work, the entire contract was for purchase and installation of Kellner jetties.

The seven installations protect a total of 21,240 lineal ft of bank or levee at an average cost of $17.80 per ft. They range in size from 374-jack installation at Santo Domingo which protects 1,410 ft of bank, to the 1,149 units placed opposite the point where Jemez Creek flows into the Rio Grande to protect 4,475 ft of bank.

For cost comparison, the corps selected the Santa Cruz emergency project on the Rio Grande where cellular crib dikes were constructed in 1951. Six dikes 100 ft long were installed to protect 1,400 ft of bank. For additional protection, a single-row Kellner jetty was placed in the streambed in front of the dikes. Cost per lineal ft of bank protected in this project was $20 excluding the Kellner jetty, and $25 including it.

Kellner jetties are considered a permanent type of bank protection. Installations are in existence which have served 30 years and have a reasonable service expectation of 50 years or longer. Installation is simple; common laborers using hand tools can set the units up, string the wire and move the completed units into place in the jetty line. Units can even be moved into place where the jetty line area is under water. A crew of 12 men has proved most efficient.

Caterpillar D337 engine (below) equipped with Model CF Torque Converter. Twin Disc Industrial-Type CF Converter (right) available in three sizes, with seven capacities each to handle any type gas or diesel engines from 40 to 1,000 hp.

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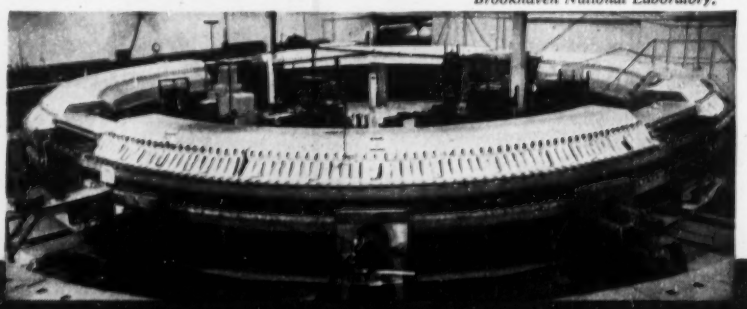
The giant Cosmotron at Brookhaven National Laboratory.



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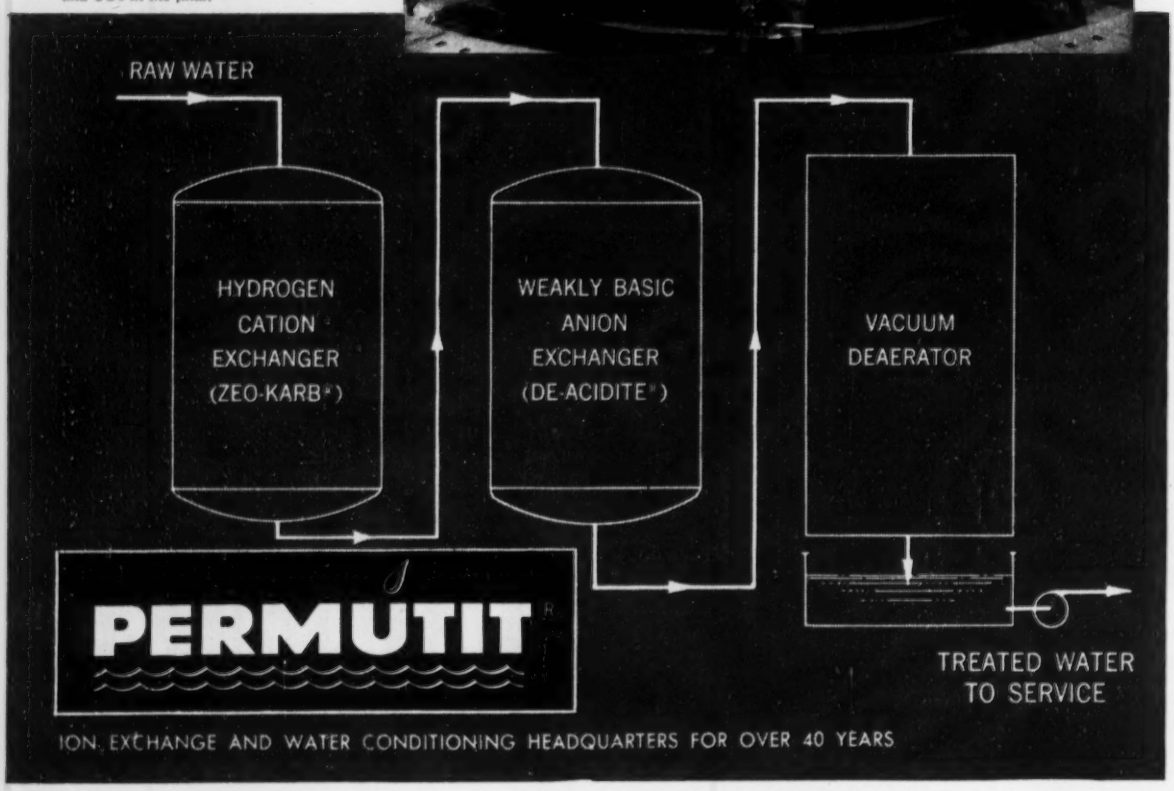
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Photos by Fahey

DIFFICULT DITCHING JOB resulted when drillers struck . . . UNDERGROUND LAKE during course of normal tunneling.

Underground lake slows tunnel job

Although Spokane, Wash., may be the last community in eastern Washington to complete its sewage disposal system in the postwar surge of sewer building, the city believes that slow progress may be pardoned.

Notwithstanding the fact that construction operations were started prior to those in other cities, contractors—already coping with hundreds of feet of sewer work in busy downtown streets and the building of three river crossings—unexpectedly hit an underground lake in their tunneling operations.

By the end of this year the project that was to cost $3.2 million is scheduled for completion at a figure of about $4.7 million.

The system design calls for 63,334 ft of sewers, plus 12,000 ft of tunnels.

Plans for a sewage disposal plant in the northwest part of the city—to be a primary treatment plant with chlorination—are being drawn by Greeley & Hansen, of Chicago, under a contract let last January. Originally the plant was to serve 170,000 persons, but it has been expanded to care for a population of 200,000.

• **Complications**—The greatest single headache in the program has been a 6,200-ft concrete sewer tunnel under Trent Avenue where contractors struck an underground lake in an area that, according to preliminary tests, should have been black basalt rock. The complication resulted in a three-week wrangle with the city council over plans to dam the flow.

Contractors Charles A. Power, of Spokane and A. J. Cheff, of Seattle, jointly bid in the section at $755,923 after diamond drilling indicated that they could drive a simple tunnel, six ft per shift through solid rock, then pour the 6,500 cu yd of concrete required. They started Feb. 1, 1951, and pushed uneventfully westward and eastward from the primary shaft through 4,800 ft of rock.

Then, 13 months after beginning the work, on Feb 27, 1953, the tunnel crew struck water where there should have been rock. They pulled the drill, and water trickled onto the rock floor of the passage.

Engineers hoped that it might be a small pocket, but the next shift drilled only four inches and the face before them began to crumble. They scrambled out with cold water rising to their knees. The tunnel maintained a steady 400-gpm volume that carried gravel and boulders with it.

Tunneling was stalled while the contractors sank a shaft to pump out the water, estimated at 3 million gallons. They installed a 1,000-gpm pump, but after several days of pumping, the tunnel was still carrying water.

• **Exploration**—What they had met was an underground "lake", an old coulee filled with saturated gravel that had washed down from the rimrock. Diamond drillings had gone 10 ft deep into solid rock for the length of the tunnel during explorations, but because the "lake" lay 12 ft below the surface, the drills missed locating it by 24 inches.

With the tunnel nearly submerged, the contractors had to discover how big the lake was. They finally decided to drive from the other (west) end of the section until they hit water. This proved a project full of suspense with the tunnel workmen never sure the face wouldn't crack and cause them to be deluged. When they hit water, it again was a trickle and nobody got wet above the ankles.

After a year's work, the tunnel was complete at both ends with a lake in the middle that measured 179 ft. Because the line paralleled the Spokane River, barely 200 ft distant in places, the contractors concluded that river water was seeping into the passage; however, chemical tests and the lowering of the Washington Water Power Co. moat to see if tunnel water low-

(Continued on page 46)

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ered with it showed that most of the water was coming from another source.

Grouting to dam the flow seemed a solution, but in 21 days of dispute the city council refused to approve this measure. The grouting might cost $100,000, which the contractors could not afford and the city rejected because the contract provided that the city pay only for grouting in solid rock.

• **Solution**—Power and Cheff finally decided to open-ditch the 179 ft, although it meant partly blockading a busy east-west arterial to do it. Open-ditching brought a new hazard; directly in the ditch lay a Western Union cable, utility lines, a water main and a live sewer. None could be disturbed—and throughout the ditching the transcontinental cable hung in the yawning open cut.

The contractors lined their ditch with interlocking sheet steel piling driven to rock. The lake proved to be 20 ft deep, and that meant blasting below the piling to the invert of the tunnel which was 32 ft below the surface.

At its lowest, the water flowed at approximately 1,250 gpm as the ditch penetrated the lake, but by using the completed tunnel for drainage, enough water was drawn off to permit ditching and concrete work. The final shovel of earth was turned on Sept. 3 and concrete pouring began on the 5-ft 10-in.-high horseshoe-shaped tunnel 4 ft 6 in. wide.

This section was one of 10 (built under 12 contracts) of the Spokane sewage disposal system. Among the first was a 4,260-ft tunnel plus a 14-in. flexible-joint cast iron pipe that was laid beneath the bed of the Spokane River.

The largest remaining section, a 2-mi ditch leading eastward from the troublesome Trent Avenue section, was awarded last fall, leaving only two small legs to complete the job, including a 280-ft river crossing at Post Street.

With the treatment plant as planned, sludge will be digested and vacuum-dried. There will be too little sludge for commercial marketing, but the park department plans to treat the sludge for use as fertilizer for lawns and flowers.

As early as 1930, the late A. D. Butler, former city engineer, and A. I. Buchecker, an assistant, drove through the United States for 2½ months in a city-owned auto studying disposal system designs. On their recommendation, the city council chose Greeley & Hansen to design a system for Spokane. But twice a bond issue failed to pass at public elections, and the proposed system lay shelved until June, 1946, when the voters approved a $1.7-million issue. With

Skyphotos photo

Philadelphia's bid for world air traffic

The recently dedicated, $15-million terminal building at Philadelphia's International Airport will be the center of commercial jet flying, according to Mayor Joseph S. Clark. The 1,100-ft-long structure has a three-story main portion topped by a Civil Aeronautics Administration control tower 105 ft above the ground.

wartime surplus cash and state funds, Spokane officials estimated that $3.7 million would build its disposal system and plant.

The men in charge: for the city, Charles E. Davis, city engineer, and Dwight L. Myers, construction engineer; for the contractor, Elmer Cheff, one of five Cheff brothers and a partner in the A. J. Cheff firm.

Water?—Tucson's got it

Here's a refreshing "change of pace"—there is one city in the U. S. that not only won't worry about a shortage of water for at least 80 years, but could even waste a little if folks were so inclined.

Tucson, the largest city in Arizona to depend upon a pumped supply, has been told that there are an estimated 6.6 million acre-ft of ground water reserves within 300 ft of the surface in the upper Santa Cruz River basin area.

According to Phil J. Martin, Jr., manager of the city's water system, that's sufficient to serve a population equal to Tucson's present 56,000 for 80 years, even though withdrawals from the basin, including those for agriculture, exceed replenishment by 26,717 mg yearly.

Although the basin's reserves are adequate as shown, the city has additional plans for even more reserve that include:

- An untapped source in the upper Avra Valley, 26 mi to the west, from which an estimated 8,000 to 10,000 acre-ft of water may be obtained.
- Acquisition of upper Santa Cruz Basin irrigated lands that, withdrawn from cultivation or used for low-water-demand crops, could add an estimated 40,000 acre-ft annually.
- Utilization of water from the San Pedro Basin near proposed Charleston Dam, 70 mi to the southeast. This could add 3.3 billion gallons. The dam is proposed as part of the Central Arizona Project awaiting congressional approval.

What—no divining rod?

Last year Dallas, Tex., hired a professional rainmaker to seed clouds with silver iodide crystals in the watershed areas of its reservoirs.

When it proved that rainfall increased the city's water supply 363% during the first six months of the year, while, during the same period, the reserves of nearby cities showed little change, Dallas signed a $52,000-contract to continue the rainmaker's services for 1954.

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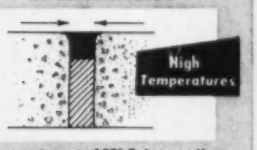

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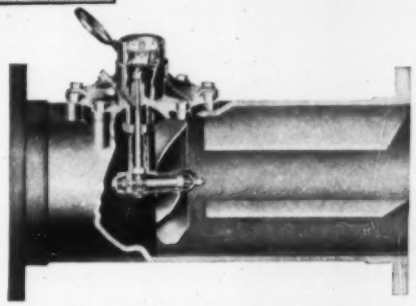

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Surveyors in Saudi-Arabia use double observations

Surveyors establishing 1000-mi of second-order levels for the Arabian-American Oil Co. in Saudi-Arabia ran two lines, using two sets of rods. One was graduated in meters and the other in feet. But this duplication didn't stem from any desire to "make work" or to satisfy the proponents of both measuring systems.

There were no existing bench marks along the line, so it was considered necessary to adopt an observation procedure with more self-checks than normal geodetic routines require. At each turning point two foot-pins were driven near each other. The metric rod turned on one and the foot-graduated rod turned on the other. The observer read top, middle and bottom wires on both rods (there was a separate recorder for each line), then signaled the metric rodman to give him a back-of-rod reading (normally three times the front-of-rod).

Except for the use of two sets of rods, procedures were modeled after U. S. Coast and Geodetic Survey second-order leveling specifications. Bench marks, located at points that can be spotted from the air, are 5 to 7 mi apart. Less than 1% of the line had to be re-run, and the two lines (metric and English systems) checked each other within 18 cm. The closure figure on existing bench marks at the termini is not known. Work was performed by Aero Service Corp. of Philadelphia.

Coal project in Australia would create port, railways

Construction of a new port and a 75-mi railroad in Northern Australia will be necessary if the Nevin Pacific Co. (a U. S. firm) is successful in its attempt to develop Australian coal fields for export of coal to Japan and other Far Eastern countries.

Nevin Pacific Co. is trying to obtain a $90-million contract from Japan for Queensland coal at less than half the price paid by Japan for U. S. coal. The firm wants to work the large undeveloped coalfields at Nebo near Mackay in Australia and probably would purchase surplus first-class modern coal equipment from an Australian government agency (the Joint Coal Board). Remaining equipment would be imported from the U. S. and Japan.

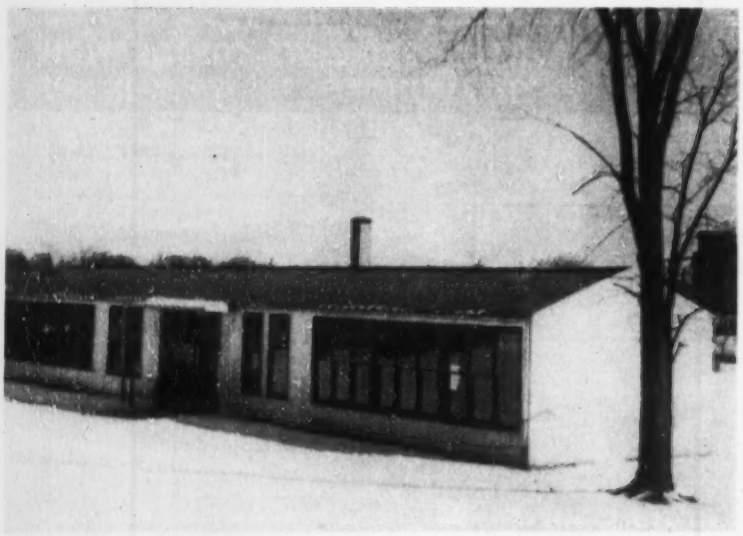
International briefs . . .

• **River diversion project**—Venezuela's National Institute of Sanitary Work plans to divert the water of the Tuy River, which runs in a loop south of Caracas, into the capital to help solve its critical waters shortage. A four-year project, it will cost an estimated $45 million and take the biggest single bite out of the amount allotted for sanitary works during 1954.

• **Cuban port improvements**—Port improvement in Cuba will be carried out under provisions of a new government plan. Under the program $10 million has been appropriated for extensive port improvements, including dredging work in the Port of Havana and on the Almendares River. Another project scheduled is an extension of the Malecon sea wall in Havana.

• **Sulphur plant slated**—Texas International Sulphur Corp. of Houston has scheduled construction of the second unit of a sulphur plant on Mexico's Isthmus of Tehuantepec. Cost of the project: $7 million.

• **Loan for Brazil hydro**—The International Bank for Reconstruction and Development has made a $10-million loan in Brazil to the Usinas Eletricas do Paranapanema S. A. (a corporation owned almost entirely by the state of Sao Paulo). Money will be used to pay for imported equipment for the construction of a hydroelectric plant at Salto Grande on Sao Paulo's Paranapanema River—and for associated transmission and distribution facilities in both Sao Paulo and Parana. The power will serve rapidly growing agricultural and urban centers and help electrify the Sorocabana Railroad.



Steel prefabs cut school building costs

Five prefabricated steel buildings, comprising an 11-classroom school, have been fully completed at a cost of $170,000 in Guelph, Ont., Canada (pop. 23,000). Average cost of a similar school facility, made of brick and stone, is estimated at $275,000 in Ontario. Roof and walls of the new buildings and constructed of specially painted and insulated steel panels.

In addition to the 11 classrooms afforded by the five buildings, there is a central unit with offices and a combination gymnasium-auditorium.

With the exception of the gymnasium, all the units are one-story structures with a concrete floor slab on gravel fill. The gymnasium has a basement and a two-story height.

Apart from the saving in cost over the usual brick and stone school construction, the prefabricated buildings will lend themselves to quick removal when the school population changes.

The first two units of the school were designed by the contractor, Wm. Parker, Guelph, and the Guelph Board of Education. Architect for the central unit of the school was Gordon Adamson, Toronto.

QUIET

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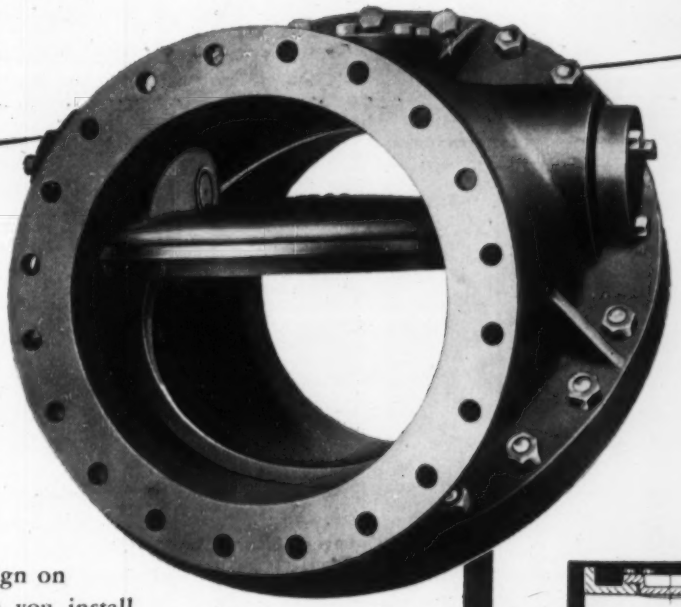

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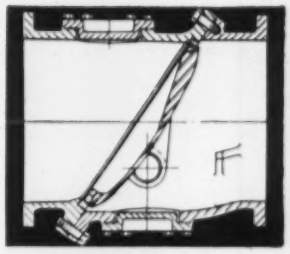

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MEN AND JOBS

National Park Service names new directors

Four assistant regional directors of the National Park Service will be promoted to head two new regional offices and two new construction divisions.

Daniel J. Tobin, now an assistant Southeast regional director at Richmond, Va., will be director of the new Northeast Region, with headquarters in Philadelphia. John S. McLaughlin, now assistant director of the Rocky Mountain Region at Omaha, will head the new Central Region from St. Louis offices.

Edward Zimmer, assistant regional director at Richmond, will be chief of the new Eastern Construction Division in Philadelphia. Samford Hill, now assistant director of the Pacific Coast Region at San Francisco, will head the new Western Construction Division, also located in San Francisco.

Directs port development

The Port of New York Authority has promoted Roger H. Gilman from deputy director to director of port development. He succeeds Joseph A. Todd, who resigned recently.

Gilman—who has been with the bi-state agency since 1937—joined the staff as a statistician after receiving his engineering degree from Harvard University.

Careers . . .

• **Naval maneuvers**—Capt. Daniel B. Ventres, special assistant to the deputy chief of the Navy's Bureau of Yards and Docks, has been assigned to the Joint Construction Agency in France. He leaves Washington this month to replace Capt. Henry J. Fitzpatrick on the staff headed by Maj. Gen. George J. Nold.

• **Reality in redevelopment**—The Sacramento, Calif., redevelopment agency—seeking to turn redevelopment of the capital city's slum area into reality—has elected former deputy state highway engineer Fred Grumm as its new chairman. Grumm retired from state service in 1950 to become a consulting engineer.

• **A full-time job**—Maine now has its first full-time chairman of the state highway commission. He is David H. Stevens, former state assessor and a civil engineering graduate of the University of Maine. Under an act passed by the 1953 state legislature, the term of the new office is seven years.

• **His problem: Traffic**—Lloyd M. Braff has resigned as Dallas, Tex., traffic manager to take over as general manager of the Los Angeles traffic department. Ralph T. Dorsey, city traffic engineer who has filled the general manager post on a temporary basis since the department was given separate charter status in May, will retire after having served for 32 years with the city.

• **Presidential election**—Directors of Harza Engineering Co., Chicago, have elected Calvin V. Davis president of the firm, succeeding the late L. F. Harza. E. Montford Fucik is the new executive vice-president; Richard D. Harza was elected vice-president.

• **Public works director**—Warren J. Mann, resident engineer on construction of water and sewage disposal system additions in Raleigh, N. C., has been named director of the city's public works department. He replaces J. B. Lambeth, who has been made chief engineer of the newly consolidated municipal engineering department.

• **Bricklayer to sales manager**—Huron Portland Cement Co., Detroit, Mich., has named its new manager of masonry cement sales: William T. Young. A member of the local bricklayers union, he joined the company in 1949. Since then he has been working in sales promotion departments and doing research on the relation between bond and the surface physics of masonry units.

• **Out of retirement**—John N. Forker has taken over his duties as new executive director of two Pennsylvania State agencies: the General State Authority and the State Highway and Bridge Authority. He retired as vice-president of Koppers Co., Pittsburgh, several years ago.

Mountain memorial

An 8,800-ft peak in Alaska's Mt. McKinley range has been named Mt. Scott in honor of Lt. Gordon D. Scott, Coast and Geodetic Survey engineer of Portland, Ore., who was killed in a plane crash near the peak. The lieutenant (son of John H. Scott, Oregon state highway engineer) was inspecting camp sites in a light plane last June when the craft crashed into a mountain ridge.

OBITUARIES

Irving M. Baker, 57, chief deputy engineer in the office of the engineer of Cuyahoga County, Ohio, died in Cleveland, Ohio, Jan. 7. His engineering work begun in 1915, included railroad, highway, bridge, military, survey and municipal projects. Before joining the county engineer's staff he was for two years with the Ohio Highway Department as assistant in charge of construction and maintenance.

Thomas J. Downey, 55, of Elizabeth, N. J., a civil engineer who specialized in water works and sewer construction, and who was one of the first engineers to become licensed under the license law of 1923, died at Elizabeth Dec. 20. For 20 years he was with C. Salvatore and Sons of Orange, N. J. and was chief engineer. He had been chief engineer of the Bayonne, N. J., sewer project and that of Ewing-Lawrence Township, N. J.

A. H. Pettigrew, 71, a pioneer in the construction of public roads, who retired last summer after 45 years with the Virginia state highway department, died Jan. 4 at Richmond. He was the oldest employe of the department in length of service. For the last 15 years he had been right-of-way engineer.

George H. Purdy, a civil engineer employed by New York State Materials, Inc., died Dec. 24 in Albany.

Daniel R. Lyon, 49, a designing engineer in the Chicago District of the Corps of Engineers, died Jan. 3 in Chicago. He was a 1928 graduate of the University of Illinois.

Ralph R. Ege, 62, an assistant construction engineer for the California Division of Highways in Fresno, died Jan. 1.

William Cartwright Lane, 55, a member of the Maryland State Roads Commission's engineering staff, died Jan. 5 in Baltimore, Md. He served the commission for four years.

Thomas J. Wren, 65, an engineer in the department of public works, Richmond, Va., for more than 30 years, died there Jan. 4.

John P. Collins, 68, a retired engineer who supervised the construction of Pennsylvania's first all concrete highway, died in Sayre, Pa., Jan. 3. During the first world war he was superintendent of the Cramp's shipyard in Philadelphia.

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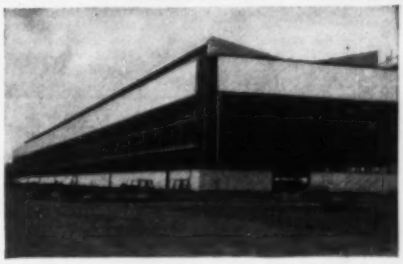

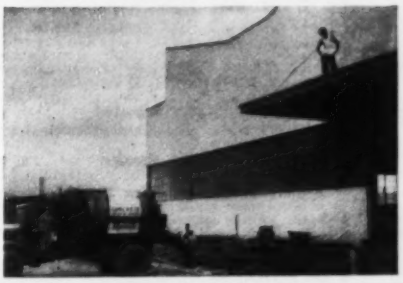

The pictures show the Republic Aviation Corporation building at Farmingdale, N. Y. The walls above the sash and all moniter ends are 2" mesh reinforced "GUNITE" carried on the steel framing. We did this job under plans and specifications prepared by Albert Kahn Associated Architects and Engineers. It is similar to scores of other industrial buildings on which we have built "GUNITE" exterior walls, and in many cases interior partitions.

"GUNITE" provided weatherproof, light-weight, permanent walls for industrial buildings, which fit well into modern industrial architecture. The inside surfaces of the walls are smooth (plywood form surface) and therefore do not collect dust and may be painted as desired.

Many other instances of repair, remodeling and new construction with "GUNITE" are described and pictured in Bulletin A2400. A request, on your letterhead, will bring a free copy by return mail.

CEMENT GUN COMPANY
"GUNITE" CONTRACTORS
GENERAL OFFICES – ALLENTOWN, PA., U. S. A.
MANUFACTURERS OF THE CEMENT GUN

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

NEW HAMPSHIRE—State Dpt. P. Wks. & Hys., State House Annex, Concord,

Marinucci Bros. & Co., Inc., 51 Ceylon St., Dorchester, Mass., CA $528,959, est. $520,000, bridge over Merrimack River at Granite St., U 325 (1) 2757, Manchester. Bids Dec. 22. CD 12/29, under LB.

† **Vermont Paving Co.**, Box 22, Burlington, Vt., LB $95,870, est. $100,000, patching, leveling and resur. bit. pavement, Ethan Allen Air Force Base, IFB 43-600-54-8, WINOOSKI, VT. Purch. & Contg. Officer, Ethan Allen Air Force Base, Winooski, Vt. Bids Jan. 5. CD 12/2.

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

Charles Capone Constr. Co., 32 Wellsmere Rd., Roslindale, Mass. LB $505,480, est. $450,000. Contr. A state hy. constr. Western Artery, Worcester. Bids Jan 5. CD 12/16.

▲ **CONNECTICUT**—State Hy. Comn., 506 State Office Bldg., Hartford,

The Mariani Constr. Co., Inc., 222 Forbes Ave. New Haven, Conn., CA, $1,153,996, est. $1,200,000 bridge across Housatonic River, approaches, Rte. 133 at Southville, Brookfield and Bridgewater. Bids Dec. 21. CD 1/4, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **E. Turgeon Constr. Co., Inc.**, 42 Weybosset St., Providence, R. I., CA $1,203,855, est. $1,200,000. VETERANS HOME, remodel and addn., Metacom Ave., BRISTOL, R. I. State of R. I. and Providence Plantations, State House, Providence, R. I. Bids Dec. 9. CD 12/16, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACT

Euclid Contr. Corp., 101 Park Ave., New York 17, N. Y. LB $233,330, Contr. 2879, foundations and incid. work, rehabilitation of Whitehall-South Street Ferry Terminal Bldgs., Manhattan Boro, NEW YORK, N. Y. Comr. Marine & Aviation, Pier 1, North River, New York 4, N. Y. Bids Dec. 21. CD 12/7.

PENNSYLVANIA—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,

Latrobe Road Constr. Inc., P.O. Box 150, Latrobe, Pa., CA $517,346, widen to 22 ft. and surf. new and existing pavement 6.46 mi. in Conemaugh Twp. from near Ferndale Boro southwesterly, U.S. 219, Somerset Co. Bids Dec. 21. CD 12/24, under LB.

Chicago Bridge & Iron Co., 1700 Walnut St., Phila., Pa. LB $189,750, constr. water storage tanks, Phila. State Hospital (Byberry), PHILA., PA. General State Auth., 18 and Herr St., Harrisburg, Pa. Bids Jan. 6. CD 12/15.

MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,

John H. Ensey, 1611 Ridgely St., Baltimore, Md. CA $789,251. grading, drainage 4.246 mi. State Rte. 5, Woods Corner to Clinton, Contr. P 391-10-315, Prince George's Co. CD 12/23, under LB.

▲ **MARYLAND**—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,

F. P. Asher Jr. Sons, Inc., 1715 West St., Annapolis, Md. CA $1,082,325. grading, drainage, surf. 2.636 mi. dual hy., Baltimore National Pike, near Ridgeville, Contr. F 537-2-715, Frederick Co. CD 12/15, under LB.

MARYLAND—State Rd. Comn., 108 E. Lexington St., Baltimore, Zone 2,

Thomas, Bennett & Hunter, Westminster, Md. LB $283,836. grading, drainage, wid'n., surf. 10.2 mi. State Rte. 105, near Baltimore, Contr. HO 258-2-715, Howard Co. Bids Dec. 29. CD 12/16.

▲† **Victor R. Beauchamp, Inc.**, 6837 Fourth St. N.W., Wash., D. C. CA $1,121,529. Schedule B, utilities for N.S.A. constr. proj. on 82 acre site, incl. roads, culverts, water distr. lines, storm drains, sanitary sewers, steam and electrical distr., FORT GEORGE G. MEADE, MD. U. S. Eng., 24 St. and Maryland Ave., Baltimore, Md. CD 12/16.

BUILDINGS

LOW BIDS AND CONTRACTS

Marcello Mezzullo, Inc., 132 Pearl St., Portchester, N. Y., CA Est. $600,000, 2 story SCHOOL, Morris Park and Pilgrim Aves., NEW YORK, N. Y. St. Theresa Church, 1912 Mayflower Ave., New York 61, N. Y. CD 4/10.

Green Constr. Co., 274 Madison Ave., New York, N. Y. CA $867,180, Junior-Senior HIGH SCHOOL, Rte. 32, WOODBURY, N. Y. Bd. Educ., Central School Dist. 1, Towns of Monroe, Woodbury, Blooming Grove, Chester and Tuxedo, School Bldg., Monroe, N. Y. Bids Nov. 19. CD 11/30, under LB.

▲ **George A. Fuller Co.**, 597 Madison Ave., New York, N. Y. CA, $2,500,000, 2 story, 180x760 ft., steel, concrete WAREHOUSE, glass-melting furnace in 120 ft. addn. to main plant, at northeast end of present factory, remodeling employees' CAFETERIA BRIDGETON, N. J. Owens-Illinois Glass Co., Ohio Bldg., Toledo, O. Giffels & Vallet, Inc., 1000 Marquette Bldg., and L. Rossetti, 1000 Marquette Bldg., both Detroit, Mich., engrs.-archts. CD 10/30/46.

Kirby & McGuire, 2518 Greenmount Ave., Baltimore, Md. LB $428,429. 2 story, bsmnt., Belvedere Beach Elementary SCHOOL, Belvedere Beach, ANNAPOLIS, MD. Anne Arundel Co., Bd. Educ., Annapolis, Md. Bids Jan. 5. CD 12/31.

▲ **Sun Constr. Co.**, 2100 Ailor Ave., Knoxville, Tenn. CA $4,504,694. Pratt Street HOUSING, Flaghouse Courts, BALTIMORE, MD. Baltimore Housing Auth., 709 E. Eager St., Baltimore, Md. CD 11/18, under LB.

Paul Rice Eng. Co., 2000 Vine St., Baltimore, Md. CA $820,000. central HEATING PLANT for Pratt Street Housing and adjacent existing developments, BALTIMORE, MD. Baltimore Housing Auth., 709 E. Eager St., Baltimore, Md. CD 11/12, under LB.

Victor Posner Developments, 514 St. Paul Place, Baltimore, Md. CA $595,000. 86 brick HOUSES, Inverton, Jasmine and Kavanagh Rds., near DUNDALK, MD. Oneida Realty, Inc., c/o Victor Posner, 514 St. Paul Pl., Baltimore, Md.

▲ **Victor Posner Developments**, 514 St. Paul Place, Baltimore, Md. CA $1,092,000. 146 brick single HOUSES, West Inverness Sect., near DUNDALK, MD. Dalton Realty Inc., c/o builder.

Mullan Contg. Co., 3945 Greenmount Ave., Baltimore, Md. CA $913,000. H-shaped Rosewood State Training SCHOOL, incl. auditorium, OWINGS MILLS, MD. State, Dpt. P. Wks., 506 Park Ave., Baltimore, Md. CD 12/30.

Kirby & McGuire, 2518 Greenmount Ave., Baltimore, Md. CA $750,000. brick SHOPPING CENTER, Reisterstown Rd. and McHenry St., PIKESVILLE, MD. Wallop, Inc., Pikesville, Md.

SOUTH

BUILDINGS

LOW BIDS AND CONTRACTS

Sullivan & Cozzart, 822 W. Kentucky St., Louisville, Ky. CA Est. $500,000. box FACTORY, LOUISVILLE, KY. General Box Co., 816 S. 16 St., Louisville, Ky. Hammond & Hammond, Washington Bldg., Louisville, Ky., archts. E. R. Ronald & Assoc., 554 S. Third St., Louisville, Ky., engrs.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction
(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects inviolved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

MIDDLE WEST

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Peerless Builders**, L. Laurence Liss, pres., 18 E. 41 St., New York, N. Y. Owner Builds. $1,250,000. 136-unit APARTMENT, LORAIN, O.

▲ **Sunrise Development Co.**, 5000 Brookpark Rd., Cleveland 29, O. Own Forces. $10,000,000. 560 frame, masonry HOMES, on 15-acre site at Stumpf and Snow Rds.; $1,000,000, 1 story masonry SHOPPING CENTER, parking for 1,800 cars, at Stumpf and Snow Rds., PARMA, O.

Wermuth, Inc., 1036 St. Marys St., Fort Wayne, Ind., general contract;

A. Hattersley & Sons, 212 E. Main St., Fort Wayne, Ind., plumbing and electrical work;

Hosler & Pearson, 215 W. State St., Fort Wayne, Ind., CA, heating and ventilating work, CHURCH on 300 block of W. Wayne St., FORT WAYNE, IND. First Presbyterian Church, Dr. John F. Meister, pastor, 201 E. Washington St., Fort Wayne, Ind. Total $829,176. A. Hensel Fink, 1701 Arch St., Phila., Pa., archt. and T. Richard Shoaff, 922 W. Berry St., Fort Wayne, Ind., assoc. archt. CD 5/1/51.

▲ **W. E. O'Neil Constr. Co.**, 2751 Clybourn St., Chicago, Ill., CA $4,873,295, general contract

Cunningham Electric Co., Anna, Ill., CA, $1,230,000 electrical work;

Economy Plumbing & Heating Co., Inc., 1308 S. Pulaski St., Chicago, Ill., CA, $2,430,000, plumbing, heating, ventilating and air conditioning for STATE OFFICE BLDG., SPRINGFIELD, ILL. State Div. Architecture, & Engr., State Capitol, Springfield, Ill. Grand total $8,533,295. Bids Dec. 15. CD 9/24.

Spence Brothers, 417 McCoskry St., Saginaw, Mich. CA Est. $500,000, 2 story, brick, steel high SCHOOL addn., FLINT, MICH. St. John Vianney R.C. Parish Flint, Mich. E. Brielmaier & Sons, 730 N. Wate St., Milwaukee, Wis., archts.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

Okla., Pauls Valley—B.A. 2/1—City, City Hall, impounding reservoir spillway, pump station and pipe line. $340,000. Plans deposit $20. Lee M. Bush & Co., Colcord Bldg., Oklahoma City, engr. CD 4/20.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

OKLAHOMA—State Hy. Dpt., Capitol, Oklahoma City,

Lyles & Buckner, Commercial Natl. Bldg., Muskogee, Okla., CA $63,957, est. $75,430, 260 ft. continuous I-beam bridge over the Klamichi River near Big Cedar, LeFlore Co.;

Moore Bridge Co., Ada, Okla., CA $317,836. est. $354,694, I-beam span bridge over the Cimarron River Hy. 18 near Cushing, Payne Co. Bids Jan. 5, awarded Jan. 6. CD 12/29.

▲ **OKLAHOMA**—State Hy. Dpt., Capitol, Oklahoma City,

McConnell Constr. Co., 5020 N.W. 16 St., Oklahoma City 7, Okla., CA $164,869, est. $204,698, stabil. aggregate base and double bit. surf. 7.967 mi. Hy. 58, south of Carnegie, Caddo Co.;

Public Constr. Co., Barnes Bldg., Muskogee, Okla., CA $62,394, est. $82,122, stabil. aggregate base and double bit. base 3.129 mi. Hy. 82 near Gideon, Cherokee Co.;

Frix & Foster, Southern Surety Bldg., Muskogee, Okla., CA $437,587, est. $511,393, traffic bound surf. 5.712 mi. Federal Lands Rte. 8082, in Ouachita Forest, LeFlore Co.;

Cohenour Constr. Co., Ardmore, Okla., CA $170,940, est. $203,189, traffic bound surf. 4.033 mi. Federal Lands Rte. 8082 in Ouachita Forest, LeFlore Co.;

W. E. Logan & Sons, Barnes Bldg., Muskogee, Okla., CA $721,763, est. $763,411, traffic bound surf. 5.714 mi. Federal Lands Rte. 8082 in Ouachita Forest, LeFlore Co. Grand total $1,557,553. Bids Jan. 5, awarded Jan. 6. CD 12/29.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Gamble Building Co.**, 1301 W. 3 Ave., Denver, Colo., —Separate Contracts. $2,500,000, 252 one story, frame RESIDENCES, COLORADO SPRINGS, COLO.

FAR WEST

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

ARIZONA—State Hy. Dpt., 17 Ave. and Jackson St., Phoenix,

Phoenix-Tempe Stone Co., Box 1670, Phoenix, Ariz.,

(Continued on page 54)

PLASTIMENT*
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CONTROLS SET AND REDUCES WATER CONTENT WITHOUT INCREASING AIR CONTENT FOR

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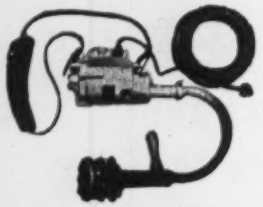

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(Continued from page 52)

LB, $308,169, clearing, grubbing, grading 8 mi. Kingman-Wickenburg Hy., State Route 93, Mohave Co. CD 6/12/52.

CANADA

BIDS ASKED—BUILDINGS

▲ Alta., Edmonton—PLANT—B.A. 3/1—Imperial Oil Ltd., 56 Church St., Toronto, Ont., lubricating oil plant, incl. solvent extraction plant, solvent dewaxing plant, etc. $5,000,000. R. W. Dunlop, 445 Christina St., Sarnia, Ont., engr. CD 3/4.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Metropolitan Vickers Electrical Ltd., Trafford Park, Manchester 17, England, CA, $1,500,000 supply 46,000 kw. steam turbo-generator for proposed steam generating plant, Wabamun Village, 40 acre site, near CALGARY, ALTA. Calgary Power Ltd., 140 First Ave., Calgary, Alta. CD 1/4.

Proposed Projects

WATER SUPPLY

▲ Colo., Fort Collins—City, City Hall, bond election in Spring, water system imprvs., incl. filter plant addn., transmission line and exten. water distr. sys. $1,500,000. R. W. Beck & Assocs., Independence Bldg., Colorado Springs, consult. engrs. and archts.

▲ Ky., Newport—City, 4th and York Sts., expansion of WW, addn. pumping units on Ohio River; addnl. filtration units at reservoir and inclosure of clearwater basin, $1,500,000, Stephens Watkins, 251 E. High St., Lexington, consult. engr. Fred L. McLane, WW dir. CD 6/10/49, under LB.

SEWERS, WASTE DISPOSAL

▲ Mass., Shrewsbury—Town, P. Wks., Dpt., Town Hall, sewerage imprvs, treatment plant, 3 pump stations, Ralph Ave., Lake Area, near Quinsigamond Bridge, north end of Jordon Pond, $2,500,000; sewer exten. approx. 20 mi. 8 to 21-in. main, $350,000, Fay, Spofford & Thorndike, 11 Beacon St., Boston, consult. engrs.

STREETS AND ROADS

▲ PENNSYLVANIA—State Hy. Dpt., 506 N. Office Bldg., Harrisburg.
Delaware Co.—constr. expressway to carry U. S. Rte. 13 through city of Chester. $12,000,000. C. H. Bucklus, c/o owner, ch. engr.

▲ UTAH—State Road Comn., 442 State Capitol, Salt Lake City.
Salt Lake Co.—expressway from Salt Lake to North Bountiful, beginning with overpass at Beck's Hot Springs. $2,000,000. CD 12/16.

▲† Washington—National Park Service, Interior Bldg., 19 and C. Sts. N.W., Wash. 25, D. C.,
highway improvements needed to keep roads open to Paradise Valley winter sports area on Mount Rainier. $3,500,000.

▲ Ont., Toronto—Metropolitan Council of Toronto, City Hall, Lake Shore Expressway, $20,000,000. Margison, Babcock & Assocs., 30 Eglinton Ave. E., Toronto, and De Leuw Cather & Co., 150 Wacker Dr., Chicago, Ill., U. S. A. consult. engrs. CD 7/13.

AIRPORTS

▲ † Mo., Sedalia—AIRPORT BUILDINGS, etc.—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., addnl. bldgs., paving, utilities, Sedalia Air Force Base, $4,642,000. J. Gordon Turnbull, 9 E. 45 St., Kansas City, Mo., consult. engr. CD 7/5/51.

▲ Mont., Great Falls—AIRPORT FACILITIES—U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash., hangar, supply and armament storage, paint storage, crash fire station, motor service shop, motor pool, aircraft parking apron, and utilities, $1,500,000; alert taxiway, $150,000, UHF air-ground facility, $50,000, ammo and shop storage, $100,000, utilities $75,000, alert hangar, $350,000 at Gore Field.

▲† Wash., Whidbey Island—HANGAR—Pub. Wks. Officer, Thirteenth Naval Dist., 1611 W. Wheeler St., Seattle, hangar addn. at Naval Air Station. $1,200,000.

PUBLIC BUILDINGS

▲ Calif., Bakersfield—SCHOOL—Kern Co. Union High School and Junior College District, 312 Bernard St., plans by Ernest L. McCoy, 2811 H St., high school, $3,000,000; plans by Wright, Metcalf & Parsons, 2323 E St., Shafter High School, $500,000. CD 2/6.

▲ Calif., Inglewood—SCHOOLS—Centinela Valley Union High School District, 231 S. Grevillea St., Inglewood. $4,000,000 bond election Mar. 9, schools. CD 11/5.

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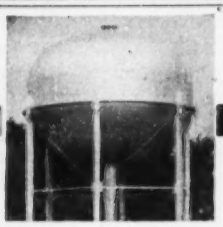

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CYLINDERS

▲ **Calif., Oakland**—SCHOOLS—City, City Hall, bond election Mar. 2, reconstr. repairing present school bldgs., $22,852,000 and constructing new schools, $7,148,000. CD 10/30/45.

▲ **Calif., San Francisco**—HOUSING—San Francisco Housing Auth., 440 Turk St., plans by Paul A. Ryan & John Michael Lee, 305 Grant Ave., 226-unit low rent housing on Harbor Slope, $2,250,000. CD 11/20/52.

▲ **Ind., Bloomington**—POWER PLANT—Indiana University, Bloomington, power plant to serve University area, $3,000,000. 9/13/45.

▲ **Mich., Pontiac**—COUNTY—Comrs. Oakland Co., 1 Lafayette St., brick, stone, steel, concrete county bldg. to house county courts and offices, 340 acre site, on West Blvd. $5,000,000. CD 12/24/52.

▲ **Minn., Edina** (P. O. Minneapolis)—SCHOOL—Bd. Educ., M. H. Kuhl, supt., plans by Haxby, Bissell & Belair, 111 Nicollet Ave., Minneapolis, Junior High School, $1,500,000; grade school addn., $300,000-$350,000. CD 2/27/51.

▲† **N. M., Las Cruces**—WAREHOUSES—U. S. Eng., Box 1538, Albuquerque, five warehouses, White Sands Proving Ground, Inv. No. 29-005-54-65. $1,000,000-$3,500,000. CD 8/28/51.

▲ **N. Y., Brooklyn**—LIBRARY—Bd. Higher Educ., 695 Park Ave., New York, Zone 21, plans by Chapman, Evans & Delehanty, 50 Broadway, New York, Zone 4, Brooklyn College Library, 2895-2955 Bedford Ave. $2,000,000. CD 2/8/45.

▲† **Va., Radford**—BAGGING FACILITIES—U. S. Eng., foot of Front St., Norfolk, addnl. bagging facilities at New River Arsenal. $17,000,000. Mills, Petticord & Mills & Assoc., 3308 Fourteenth St. N.W., Wash., D. C., engrs.-archts. CD 6/20/52.

▲ **Va., Richmond**—SCHOOLS—Henrico County School Bd., 22nd and Main Sts., voted $4,000,000 bonds Dec. 30, schools. $6,435,000. CD 12/18.

▲ **Alta., Calgary**—POWER PLANT—Calgary Power, Ltd., 140 First Ave. W., steam power plant near here at Wabamun Village, 40-acre site. $10,000,000.

▲ **Man., Churchill**—GRAIN STORAGE—National Harbors Bd., Parliament Bldgs., Ottawa, Ont., grain storage facilities at Churchill Seaport on Hudson Bay, to double capacity to 5 million bushels. $2,000,000.

COMMERCIAL BUILDINGS

▲ **Calif., Sacramento**—DWELLINGS—Larchmont Village, 2894 Rowena Ave., plans by Wm. M. Bray, 962 N. La Cienega St., Los Angeles; 3,000 frame dwellings in vicinity of McClellan Field. $20,000,000.

▲ **Conn., New Haven**—SHOPPING BLOCK—Morton Realty Co., David Carben, pres. and treas., 172 N. Main St. West Hartford, plans by Irving W. Rutherford, 49 Garden St., Hartford, 2 story, with stores on 1st floor, offices on 2nd floor, 100,000 sq. ft. floor area, shopping block with large parking space, on 9-acre tract, Bishops Corner, $1,600 000.

▲ **Kan., Kansas City**—HOSPITAL—St. Margaret's Hospital, 8 and Vermont Sts., hospital addn. $2,500,000.

▲ **Mich., Lansing**—HOSPITAL—St. Lawrence Hospital Bd. Trustees, 1210 W. Saginaw St., brick, steel, concrete hospital addn. $1,700,000.

▲ **Tex., Houston**—BANK, etc.—Second National Bank of Houston, 800 Main St., plans by Kenneth Franzheim, 2402 Crawford St., 24 story, bsmnt. bank and office, first 4-floors 250x250 ft. and the 20 story tower above will contain 380,000 sq. ft. steel frame, granite on brick constr. $5,000,000; parking garage adjacent to bank, $500,000. H. E. Bovay, Jr., M. Esperson Bldg. and Reg. F. Taylor, Bankers Mortgage Bldg., and Ward Butterwick, 2303 LaBranch St., consult. engrs.

▲ **Va., Alexandria**—RESIDENCES—Ornstein Constr. Co., 1025 Vermont Ave. N.W., Wash., D. C., plans by Berla & Abel, 1636 Connecticut Ave. N.W., Wash., D. C. 96 two story bsmt., masonry residences. $1,500,000.

▲ **Wis., Kenosha**—SCHOOL, etc.—Regional Diocesan High School, 2000 W. Wisconsin Ave., Milwaukee, Zone 3, plans by Mark F. Pfaller Assocs., 7613 W. State St., Wauwatosa, Zone 13, Central Catholic High School and Convent, $2,000,000.

▲ **Que., Granby**—MODEL TOWN DEVELOPMENT—Doris Robert & George Avery, 149 St. George St., plans by Tremblay & Belanger, 135 Principale St., model town development, incl. 200 houses, 6 apartment blocks, 30 stores, theatre, etc., Mont-Sacre-Coeur east section of town, $2,000,000. CD 10/31/51.

INDUSTRIAL BUILDINGS

▲ **Me., Yarmouth**—POWER PLANT—Central Maine Power Co. 443 Congress St., Portland, 50,000 kw steam power plant approx. $10,000,000.

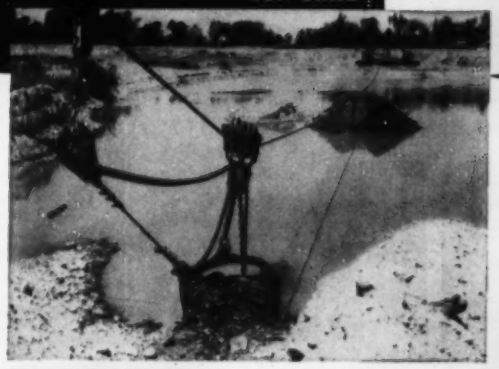
▲ **Va., Waynesboro**—PLANT—General Electric Co., River Rd. Schenectady, N. Y., 1 and 2 story, 200,000 sq. ft. rein.-con., structural steel, masonry Specialty Control Plant. $2,500,000. Whitman, Requardt & Assocs., 1304 St. Paul St., Baltimore, Md., consult. engrs. CD 11/12.

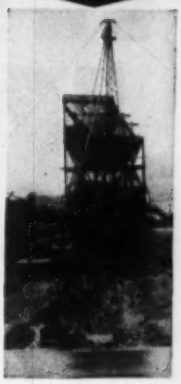
UNCLASSIFIED

▲ **Mich., Warren**—RACING PLANT—Thoroughbred Turf Club, Dick Frederick, 522 Free Press Bldg., Detroit, will not construct racing plant, track, grandstand, clubhouse, stables, etc., Schoenner and 12 Mile Rd. $3,000,000. Project abandoned. CD 11/7.

the pit: tough... 70% ROCK 30% SAND

the machine: Sauerman 2½-cu. yd. slackline cableway excavator





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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

February 9 Massachusetts

STREETS AND ROADS

January 28 Massachusetts

▲† **N. H., Portsmouth**—UTILITIES—B.A. 2/26—U. S. Eng., 857 Commonwealth Ave., Boston, Mass., constr. utilities, heat distr. sys., road and railroad, ENG-19-016-54-59, Air Force Base. $4,000,000. Plans deposit $35. Whitman & Howard, 89 Broad St., Boston, Mass., engrs. CD 12/27/51.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Tredennick-Billings Co.**, 10 High St., Boston, Mass., CA Est. $2,000,000. 202x252 ft., masonry DISTRIBUTION FACILITIES and OFFICE, NEWTON, MASS. General Electric Co., Lamp Div., 50 High St., Boston, Mass. Bids Dec. 21. CD 12/9.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

January 26 Maryland February 2 New Jersey

STREETS AND ROADS

January 26 Maryland January 28 New York

BIDS ASKED—BUILDINGS

▲ **N. Y., Uniondale**—HIGH SCHOOL—B.A. 2/2—Bd. Educ., Union Free School Dist. 2, Uniondale, Junior-Senior High School. $4,000,000.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith, State Office Bldg., Albany, **DelBalso Constr. Corp.**, 500 Zerega Ave., New York, N. Y. CA $7,162,902, est. $7,721,000. New York State Thruway-Hudson Sect.-Subd 9A (Nyack Approach to Tappan Zee Bridge); Nyack Interchange, access ramps; New Jersey State Line-Nyack Pts. 3 and 4, S.H. 8136-5682; Nyack Village; Main St. S.H. 9459; Knapps Cors.-Nyack S.H. 5178 and Nine misc. secondary cross roads incl. relocation of railroad tracks 4.46 mi. ACC. 1.57 mi. Thy. H.T. 53-10, R.C. 53-121, S.T. 53-33, Rockland Co.;

Klevens Corp., Federal St., Yonkers, N. Y. CA $2,515,356, est. $2,850,000. New York State Thruway-Hudson Sect. Sub 8 (Suffern-Nyack Pt. 1) 0.21 mi. H.T. 53-12, Rockland Co. CD 12/7, under LB.

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith, State Office Bldg., Albany, **Johnson, Drake & Piper, Inc.**, 86 Trinity Pl., New York 6, N. Y. CA $6,543,397. c. conc. pavement, two at 25 ft. variable width, 9.95 mi.; asph. conc. Type 1a, opt 2.85 mi. misc. work 0.08 mi.; five hy. seps. comp I-beams 217.2 ft., 194.5 ft., 175.8 ft., 186.2 ft. and 207.4 ft. 2 bridges, twin box 25 ft. and 25 ft. 2 bridges comp I beams 57 ft. and 57 ft., altering existing railroad bridge 5.94 mi. Access, 6.94 mi. Hy. Palisades Interstate Park-Goshen Pts. 1A and 1B, Central Valley-Turners SH 115; Highland Mills-Monroe S.H. 413; Monroe-Washington S.H. 9057, Proj. F-IG-1050 (7), Contr. 1, F-1050 (8), Cont. No. FASH-53-15, FARC 53-129, Orange Co. Bids Nov. 19, awarded Dec. 17. CD 11/24.

▲ **NEW JERSEY and PENNSYLVANIA**—Delaware River Port Auth., Administration Bldg., Bridge Plaza, Camden, N. J.

Booth & Flinn Co., 1942 Forbes St., Pittsburgh, Pa., LB, $3,647,075, Contract No. 3, anchorage superstructures, incl.: Schedule "A", Philadelphia Anchorage Superstructure Schedule "B" Gloucester Anchorage Superstructure for suspension bridge over Delaware River connecting Packer Ave. in Phila., Pa. to Gloucester City, N. J. Bids Jan. 13. CD 12/28.

▲ **NEW JERSEY**—N. J. Hy. Auth., State Hy. Office Bldg., 1035 Parkway Ave., Trenton,

Poirier & McLane Corp., 33 W. 42 St., New York, N. Y., CA, $6,866,065, 1.95 mi. Garden State Parkway from Arlington Place, E. Orange to D.L. & W. R.R. Bloomfield, Contract No. 46, Essex Co. Bids Nov. 19, awarded Dec. 17. CD 11/24, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Planet Constr. Co.**, 11 W. 42 St., New York 36, N. Y., CA $2,038,000. Junior HIGH SCHOOL 117, Willoughby Ave. between Kent and Franklin Aves., BROOKLYN, N. Y. Director Bureau Constr., 49 Flatbush Ave. exten., Brooklyn 1, N. Y. Bids Nov. 18. CD 11/24, under LB.

▲ **William E. O'Neill Constr. Co. Inc.**, 403 Wilson Bldg., Syracuse, N. Y., LB $3,922,270, nineteen bldgs. to house instruction, etc. and service connections, VETERINARY COLLEGE, Cornell University, Spec. 17162, 3-4-5-&-6. ITHACA, N. Y. Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, N. Y. Isadore Rosenfeld, 45 W. 45 St., New York, N. Y., archt. Bids Jan. 7. CD 12/24.

▲ **Barkley Homes, Inc.**, 1874 Pratt St., Phila., Pa. Separate Contracts. $5,000,000. 200 RESIDENCES, West Norriton Twp., NORRISTOWN, PA. George Hay, Lima, Pa., archt.

▲ **White Constr. Co.**, 95 Madison Ave., New York, N. Y. CA $8,500,000, cracker BAKERY, OFFICES and SHIPPING BRANCH, PHILA., PA. National Biscuit Co., 449 W. 14 St. New York, N. Y. Ford, Bacon & Davis, Inc., 39 Broadway, New York, N. Y. engr.-archt. Bids Sept. 15. CD 9/3.

▲ **Charles H. Tompkins Co.**, 906 16 St. N.W., Wash., D. C., CA, $6,268,000, 350-bed HOSPITAL, 12 and Varnum Sts., N.E., WASH., D. C. Providence Hospital, 2 and D Sts. S.E., Wash., D. C. Bids Dec. 8, awarded Jan. 8. CD 12/10, under LB.

▲ **Camden-Dover Housing Corp.**, 10521 Pinewood Court, Hyattsville, Md., Separate Coutracts, $3,000,000. RESIDENTIAL DEVELOPMENT, Route No. 13, CAMDEN, DEL. Morton Noble, 1019 15 St. N.W., Wash., D. C., archt.

▲ **E. I. du Pont de Nemours & Co.**, Nemours Bldg., Newark, Del., Separate Contracts, $3,000,000 Polychemicals LABORATORY, NEWARK, DEL. H. M. Gordon, owner's constr. supervisor.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

January 26 North Carolina January 27 Virginia

STREETS AND ROADS

January 26 North Carolina January 27 Virginia

BIDS ASKED—BUILDINGS

▲ **Fla., Chattahoochee** — INFIRMARY — B.A. 2/23 — Florida State Imprvt. Comn., Caldwell Bldg., Tallahassee, Infirmary at State Mental Hospital $2,000,000. CD 9/23.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Batson-Cook Co.**, West Point, Ga., LB, $3,033,931, Schedule A;

G. A. Paul Constr. Co., 1925 29 Ave. S., Homewood, Ala., LB, $870,700, Schedule B;

Kaminer Constr. Co., 303 S. Hudson St., Greenville, S. C., LB, $695,700, Schedule C;

Foster & Creighton Co., American National Bank Bldg., Nashville, Tenn., LB, $732,715, Schedule D, facilities for Air University, MAXWELL AIR FORCE BASE, ALA. U.S. Eng., P.O. Box 1160, Mobile 7, Ala. Bids Jan. 7. CD 12/15.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

January 26 Indiana

STREETS AND ROADS

January 26 Indiana

BIDS ASKED—BUILDINGS

▲ **Mich., Lincoln Park**—WAREHOUSE—B.A. 2/3—State, A. N. Langius, dir. State Bldg. Dpt., Lewis Cass Bldg., 500 S. Walnut St., Lansing, monolithic concrete, corrugated cement asbestos, steel, 240,000 sq. ft. warehouse also brick, steel 10,400 sq. ft. ad bldg. $2,000,000. Plans deposit $50. Leis G. Redstone, 10811 Puritan St., Detroit, Zone 38, and Otis Winn, 524 Michigan Bldg., Detroit, Zone 26, archts. CD 11/17.

▲ **Ill., Bedford Park**—SCHOOL—B.A. 2/10—School District No. 200, Summit, Reavis High School, new here, $2,500,000. L. F. Coleman, 6240 S. Kimbark Ave., Chicago, archts.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Poirot Constr. Co.**, 2001 Pershing Rd., Chicago 9, Ill. CA, $2,566,855, PROFESSIONAL SERVICE BLDG. and private pavilion, CHICAGO, ILL. Michael Reese Hospital, Ellis Ave. and 30 St., Chicago, Ill. Bids Dec. 8, awarded Jan. 4. CD 12/18, under LB.

▲ **Sun Builders, Inc.**, 604 Higgins Rd., Park Ridge, Ill., Own Forces, $9,000,000. 500 HOMES, near Crawford and Rte. 58, SKOKIE, ILL.

▲ **Young Men's Christian Assn.**, 633 N. 4 St., Milwaukee 3, Wis., rejected bids Nov. 17, CLUBHOUSE, MILWAUKEE, WIS. Est. $3,500,000. CD 10/21.

▲ **Harry Slatkin Builders, Inc.**, 11534 Dexter St., Detroit, Mich. Owner Builds. $3,400,000. 300 single brick ranch HOMES, Westbrook Sub-division, Trinity, Braile, Pembroke Sts., DETROIT, MICH.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Texas-New Mexico**—OIL LINE—B.A. 2/16—Magnolia Pipe Line Co., Magnolia Bldg., Dallas, Tex., 56 mi. 8 in. crude oil line Seminole, Tex. to Gladiola Jct. in Lea Co., N. M. $2,600,000. CD 12/17.

BIDS ASKED—BUILDINGS

▲ Minn., Hopkins—SCHOOL—B.A. 2/23—Bd. Educ., R. Child, clk., high school, north of Hy. No. 7 on 13 Ave. $3,000,000. Bissell & Belair, 1111 Nicollet Ave., Minneapolis, archts. CD 12/5/51.

▲† N. M., Los Alamos—HOUSING—B.A. 3/3—U. S. Govt. Atomic Energy Comn., c/o Ch. of Procurement Sec., Los Alamos Field Office, Los Alamos, A.E.C. Group 16, 122 one story, wood single housing units, Inv. No. 291-54-10.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† U. S. Eng., foot of Prytania St., New Orleans, La., cancelled bids to have been opened Jan. 13, relocating St. Louis Southwestern Ry. embankment constr. between Texarkana and Naples generally paralleling Hy. No. 67, Texarkana and Naples, Bowie and Cass Counties, Inv. No. 54-112, TEXAS. Est. $2,000,000-$4,500,000. CD 1/7.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Delta Engr. Corp., 2121 San Felipe Rd., Houston, Tex., CA $3,250,000. natural gasoline PLANT, SEMINOLE, TEX. Cities Service Oil Co. & Associated Companies, M. Esperson Bldg., Houston, Tex. CD 1/13.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

January 28 Washington

STREETS AND ROADS

February 4 California

BIDS ASKED—BUILDINGS

▲ Ariz., Phoenix—BANK—B.A. 2/10—First Bank Building Corp. of Phoenix, First National Bank of Arizona, 16 North 1 Ave., 10 story, bsmnt., structural steel, face brick bank. $3,750,000. Plans deposit $150. Robert L. Rolfe, 2401-A Bryan St., and Zumwalt & Vinther, 929 Merchants Security Bldg., both Dallas, Tex., engrs. Wm. D. Reed, archt., 220 Merchants Security Bldg., and H. Edward Smith, planning consulting archt., Merchants Bank Bldg., both Dallas, Tex. CD 10/13/50.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ C. F. Braun Co., 1000 S. Fremont Ave., Alhambra, Calif., CA Est. $2,500,000, HYDROBON PLATFORMER to produce premium grade motor fuels, AVON, CALIF. Tide Water Associated Oil Co., Avon, Calif. Universal Oil Products Co., Des Plaines, Ill., engr.

▲ Theo. G. Meyer & Sons, Quint and Custer Sts., San Francisco, Calif., CA, $5,302,175, Western Addition HOUSING, Project Cal 1-18; Unit 2, SAN FRANCISCO, CALIF. San Francisco Housing Auth., 440 Turk St., San Francisco, Calif. Bids Jan. 5, awarded Jan. 8. CD 12/2.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

January 26, February 5 Nova Scotia

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Brunet & Brother, 1 Strathmore Blvd., Strathmore, Que., Owner Builds, $4,000,000. 420 concrete, brick, stone DWELLINGS, RIVIERE DES PRAIRIES (P.O. District MONTREAL) QUE.

▲ A. & J. Brunet, 550 Cherrier St., Ile Bizard, Que., Owner Builds, $2,750,000, 300 one story, bsmt., concrete, brick DWELLINGS, RIVIERE DES PRAIRIES, QUE.

LATIN AMERICA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ Raymond Concrete Pile Co., 140 Cedar St., New York, N. Y., CA exploratory drilling for harbor imprvs., breakwater, railroads, concrete roads, steel frame bldgs., ACAJUTLA, EL SALVADOR. Comision Ejecutiva del Puerte de Acajutla (CEPA Direccion de Urbanismo y Arquitectura, Avenue sur 74, San Salvador, El Salvador. Total est. $20,000,000. CD 11/16.

AMERICANS ABROAD

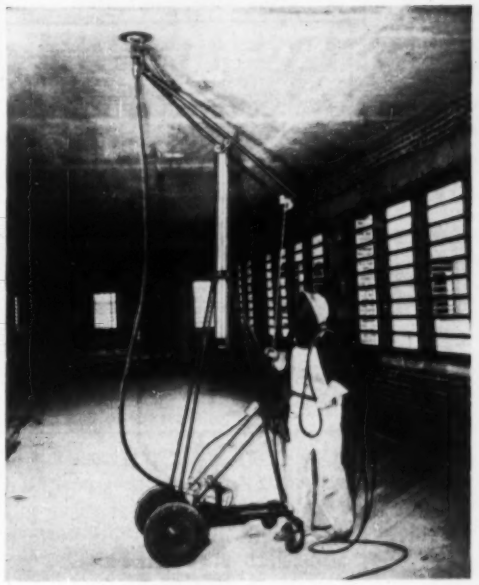
HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ † Raymond Concrete Pile Co., 140 Cedar St., New York, N. Y., Walsh Constr. Co., 122 East 42nd St., New York, N. Y., and Brown & Root, 4100 Clinton Dr., Houston, Tex., U. S. A. CA, Total est. $150,000,000, airbases for Army and Navy, SPAIN Bureau of Yards and Docks, Navy Dpt., 18 St. and Constitution Ave. N. W., Wash. 25, D. C. CD 10/12.

(Proposal Advertisements see pp. 61 and 62)

RUBBING CEILINGS?



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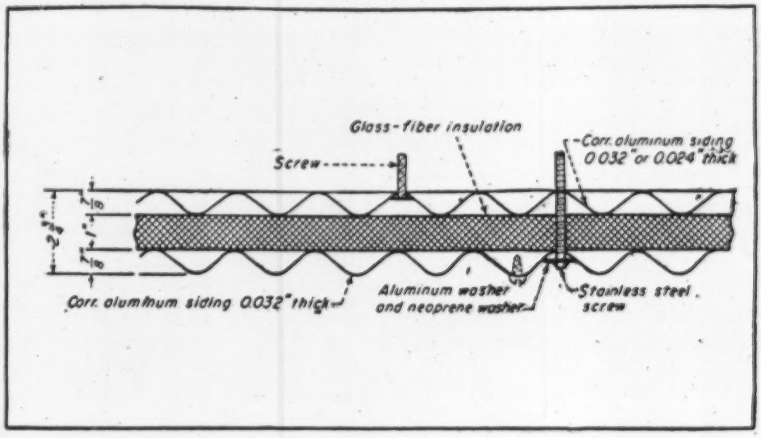


LOW COST MATERIAL—Cross section of corrugated aluminum sidewall panel used in building Air Force forging press plant, Cleveland.

Sandwich sidewall prices—three types

Prices on three new types of sandwich sidewall construction, by type of fastener, have been made available in connection with the building of the Air Force's new heavy forging press plant in Cleveland, Ohio. Six sub-contractors submitted bids on each type to the Aluminum Corporation of America, builder of the plant. Corrugated aluminum emerged as the low-cost material with corrugated asbestos cement and corrugated galvanized painted steel following in the order.

The aluminum sandwich walls consist of two industrial corrugated building sheets, alloy 4S Alclas; one 0.024-in thick for backing and the other 0.032-in thick for facing. A one-inch layer of Fiberglas, type PF-615 provides the insulation.

Corrugated aluminum sandwich wall

Type fastener	No. bids	Price per square foot — Low bid	High bid	Average
Self-tapping screw	1	$1.15	$1.15	$1.15
Nelson stud	3	0.96	1.20	1.10
Widman stop rivet	2	1.03	1.18	1.105
All types	6	0.96	1.20	1.11

The second choice offered to bidders, the corrugated asbestos cement wall, utilizes a 1¼-in Cemesto board as backing and insulation. Standard corrugated cement asbestos is used for facing.

Corrugated asbestos cement sandwich wall

Type fastener	No. bids	Price per square foot — Low bid	High bid	Average
Hook of "J" bolts	5	$1.14	$1.34	$1.24
Nelson studs	1	1.72	1.72	1.72
All types	6	1.14	1.72	1.32

A 20-gauge backup sheet and a 22-gauge facing sheet of corrugated galvanized steel plus a one-inch layer of Fiberglas insulation, type PF-615, comprise the galvanized steel wall option. All galvanized steel sheets are to be painted with one coat of wash primer. Aluminum vinyl paint will be applied to all surfaces before erection and to outside surfaces after erection.

Corrugated galvanized painted steel sandwich wall

Type fastener	No. bids	Price per square foot — Low bid	High bid	Average
Self-tapping screw	3	$1.28	$1.68	$1.47
Nelson stud	3	1.23	1.56	1.396
All types	6	1.23	1.68	1.45

Also included in the architect's specifications was a choice between corrugated plastic or corrugated wire glass in place of the usual sash and glass. Sandwich-wall area in the corrugated plastic design is 157,711 sq ft. In the alternate corrugated wire glass design, the area is 187,180 sq ft. However, despite the fact that the corrugated plastic choice requires twice as much material, it's cost would still be lower than that of the corrugated wire glass.

Contractor	Corr plastic	Corr wire glass
A	$1.01	$2.44
B	1.34	2.58
C	1.21	2.54
D	0.95	3.76
E	1.12	2.89
F	1.04	2.37
Average	1.11	2.76

The plant will be 1,063-ft long and 480-ft wide. Over the 82,000-sq ft press bay it is 100-ft high; over the rest, 52-ft high. McGeorge, Hargett and Associates, Cleveland, are the consulting engineers.

Money: not too difficult to find

Rates won't go higher for next few months, and may go lower, although the decline won't be very steep

J. P. Chamberlain
Associate Editor

Last week in Wall Street, headquarters for many of the country's biggest commercial banks, there were rumors of a cut in interest rates on bank loans. These rumors may just be rumors. Or, if a rate cut comes at all, it might not happen for two or three months. But one thing is sure: Construction money is going to be available for credit-worthy borrowers, at fairly easy terms.

Several months back (Sept. 24, '53, p. 21), ENR predicted that there would be no rise in interest rates for as far in the future as anyone could see then—that is, for the next few months. Since then, interest rates have continued to go lower on all forms of borrowing. This week the outlook is still the same: No rise in interest rates, possibly lower rates, though the trend to lower rates will probably not be as strong as it has been recently.

Since September, corporations and local governments—and the U. S. government, too—have been able to get long-term money at lower rates. At the same time, short-term money—of which the most important type is bank loans—has continued to get easier to find. That means contractors with good credit ratings should have no trouble getting financing from banks and finance companies for working capital and for new equipment.

• **Mackinac sells**—Last week, for instance, a big bond issue which proved impossible to sell less than a year ago was offered to investors. That was the $80-million Series A issue of revenue bonds to finance the Mackinac Bridge. Another issue of $20 million Series B bonds, which will have a secondary position where interest and amortization are concerned, is to be offered later. The purpose of splitting the issue into two parts was to improve the credit position of the major part of the issue, while allowing a smaller part to be bought by investors interested in a very-high-paying, speculative, tax-exempt bond.

The success of the Mackinac issue is only one sign of our easy bond market. Last week, for instance, the State of California borrowed the final $50 million to finance its $150-million farm and home loan program for veterans. This time, it cost California only 1.93%. When the initial $100 million of bonds were sold in February 1953, the cost to the state was about 2.42%.

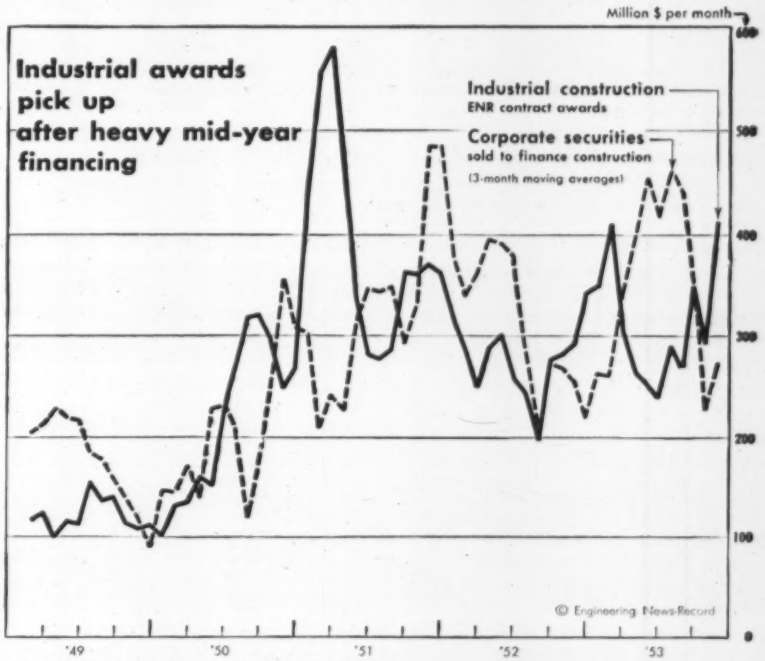
Take another example, this one from the new corporate bond issues. Public Service Co. of Indiana, Inc., sold $25 million of first mortgage bonds last week to one of two hotly competing underwriting groups. The winning syndicate bid a price that meant a borrowing cost to the utility of about 3.27%. The last comparable utility issue, sold on Dec. 2 by Iowa Power & Light Co., cost the borrower 3.33%. This may sound like a small decrease in cost, but it makes a very large difference when several millions of dollars are involved over a long period of time.

• **Short-term money**—The tendency to cheaper money also exists in the short-term field, as shown by the Wall Street rumors about the "prime rate" (the rate banks charge blue-ribbon borrowers on 90-day loans). The prime rate has been 3½% since last spring, but now might drop to 3%. This is denied by some bankers. But quite a few money-market observers think there might be a cut within the next couple of months. For some time already, banks have been a little less choosy about the customers they class as top-grade risks, and bank vice-presidents have been a bit more eager to pick up the check when lunching with potential borrowers.

Naturally, a change in the prime rate would mean a change all along the line in rates which the banks charge customers. And if one or two big banks in New York City or elsewhere should cut rates, the others would be forced to go along to hold their customers.

• **Background**—What are the reasons behind this easy-money situation? Basically, the reason is that our business superboom has been slowing down for several months. This means there

(*Continued on page 60*)



INDUSTRIAL AWARDS FOLLOW BOOM in corporate financing—As often before in the past, industrial awards reported to ENR and the Construction Daily are starting to pick up, following a heavy volume of corporate financing for construction in the middle of 1953.

is less demand for money from corporate borrowers. Take a look at the chart (page 59) to see how corporate borrowing for construction has tapered off in the past few months.

At the same time, there are plenty of funds available to lend. The institutional lenders—insurance companies, commercial and savings banks, savings & loan associations, pension funds—picked up about $15 billion in savings last year. That's a record. Although the inflow of savings to these institutions is now tapering off, it is expected to hold up well in 1954.

So the supply of available money for lending is dropping more slowly than the demand for borrowed money.

This means that lenders are becoming more eager to lend money and borrowers in turn are becoming more coy about borrowing. The result: lower interest rates.

• **Commercial banks**—You can trace this situation very easily in the case of commercial banks. Their primary function is lending short-term money to business. When their business loans drop off, they tend to move over into the bond and mortgage markets. Here they compete with other investors to drive up the price of these long-term debt instruments, making it possible for new borrowers coming into the market to sell bond issues and mortgages at lower interest rates.

Last fall, bank loans to business did not rise anywhere near as much as usual in recent years. That was a signal to the bond and mortgage markets that rates were going to be easier. Now in January bank loans are starting their usual seasonal decline. So far, it appears the decline will be steeper than usual.

The latest available nation-wide report for Federal Reserve member banks shows a record decline in business loans of $438 million for the week ended Jan. 6. That's a record not only for the first week of the year but for any week since these statistics have been kept.

Probably a large part of this decline was caused by the expiration of the excess-profits tax on Dec. 31, which makes it less advantageous (from a tax standpoint) to borrow money. But nevertheless the decline in business loans is expected to be greater for the next few months than is usual for this time of year. If you want a good tipoff on whether bank money is going to be cheaper to borrow, watch the Federal Reserve Board's weekly figures on loans of reporting member banks in leading cities. They are published Thursdays in the financial sections of most big daily newspapers.

• **FRB and Treasury**—Another very important factor in the money situation is the attitude of the Federal Reserve Board and the Treasury. FRB can influence short-term and long-term interest rates by increasing or decreasing the lending power of commercial banks. The Treasury can influence long-term rates by the type of securities it offers when it has to refund maturing government securities or to borrow new money. For instance, if the Treasury offers long-term bonds, they compete with mortgage borrowers and with corporate borrowers for the available supply of long-term money.

Last spring, a fairly small offering of long-term bonds by the Treasury, sold at a time when corporate demand for long-term money was very heavy, and coupled with an announced policy by FRB to let normal forces of supply and demand take their course, demoralized the bond and mortgage markets. Interest rates went up sharply, a few proposed bond issues were abandoned or postponed, and home builders ran into trouble getting mortgage money on VA and FHA loans.

But since then FRB and Treasury have changed their approach. They have explained that they acted as they did last spring in order to check inflationary borrowing. Now that deflation is the major problem, FRB and the Treasury will work in the direction of keeping money easy, in order to prevent a recession.

A 2,240-mi pipeline is planned for Canada

As a result of the largest merger in Canada's financial history, the way is now clear for the construction across Canada of what will be the longest natural gas pipeline in the world.

It is expected that work on the line will start by mid-summer.

Earlier this month, Trade & Commerce Minister C. D. Howe announced in Ottawa the successful completion of talks between the two main companies which have been competing for rights to carry Alberta natural gas outside of that province. The two companies, Trans-Canada Pipelines Ltd., and Western Pipe Lines Ltd., have agreed to form what probably will be a $300-million corporation.

The line will be 2,240 mi long, starting from Princess, Alberta, and running through Regina, Winnipeg, Kenora, Port Arthur, and Sudbury. In Ontario Province, the line probably will branch. One branch will go south to Toronto and southern Ontario, where about half the people in Canada live. The other would stretch eastward across Quebec Province to reach Montreal, and possibly Three Rivers and Quebec as well. Prospects are that the line will reach Winnipeg in 1955, and get to Toronto and other eastern points by 1956.

Wenzlick is gloomy

He predicts big price drop in homes for 1954-1957, upturn in '58

Roy Wenzlick, the St. Louis real estate analyst, last week made a bearish prediction on future prices of existing homes. Wenzlick told the annual real estate forum sponsored by Cleveland's big savings bank, the Society for Savings, that prices of older homes might decline as much as 30% over the next four years, with less pronounced declines on new houses. However, he said prices of many of the small post-World War II houses might drop even more than 30%, as owners try to get rid of them to buy larger dwellings.

In common with many other economists, Wenzlick predicts a decline in formation of new families over the next few years, because the "hollow generation" born during the 1930s (when birth rates were low) will be the group providing most of the new marriages. That, he thinks, will have a depressing effect on real estate prices.

• **Good time coming**—He believes, however, that by about 1958 the real estate situation will change, as the first members of the post-1940 baby boom reach maturity and start forming families. That's why he is willing to predict that 10 years from now, existing new homes probably will be worth more than they are today.

For 1954, Wenzlick looks for little overall change in the price of new houses.

In some areas, the prices will go up, in others they will trend downward. Builders in some areas will shade profits in order to bring prices down. On older homes, he believes, prices will soften. Competition, along with increasing buyer caution, will force builders to do a better job of selling.

Studies made by Wenzlick's organization show building activity in the older, more mature areas like the east central section, is standing up better

than in areas where growth has been sudden, as on the West Coast. He is of the opinion that the reason is that the newer regions have overbuilt more than have established areas, so the downswing is more pronounced.

Here are Wenzlick's 1954 predictions for various building categories: factories, down 15%; offices, up 15%; stores, up 7%; farm building, down 10-15%; public housing, down 35%; schools, up 11%; public hospitals, down 20%; and private hospitals, down 4-5%.

Blaw-Knox buys Apsco

The plans of Blaw-Knox Co., Pittsburgh, to broaden its activities in the field of highway paving came to a head last week in the company's purchase of the All Purpose Spreader Co., Elyria, Ohio, which will be operated as a part of the Blaw-Knox Equipment Division.

Apsco manufactures a bituminous paver-finisher, and Blaw-Knox has previously sold only a bituminous paver, with the bulk of its other roadbuilding equipment concentrated in the concrete road field. Acquisition of Apsco places Blaw-Knox in the bituminous road equipment business in a much bigger way than formerly.

Only within recent weeks, Apsco has come out with a new rubber-mounted paver—finished with several other modern features (ENR Jan. 14, 1954).

Business briefs . . .

• **Westinghouse expansion**—Between now and 1955, Westinghouse Electric Corp. plans to spend $110 million on plant and equipment. The company expects its 1957 output capacity will be about 30% higher than it was in 1953.

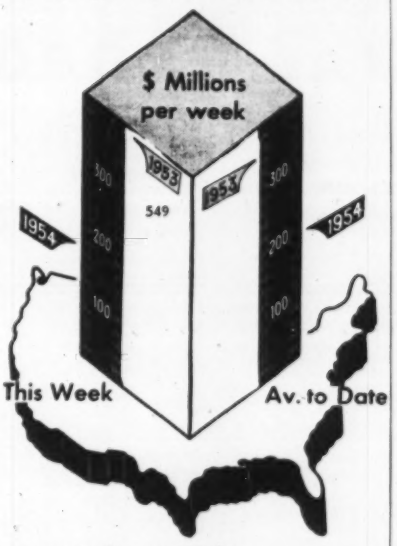
• **Store construction**—A survey of 250 stores made by the National Retail Dry Goods Assn., shows that half of them plan major capital spending this year.

• **West Virginia Turnpike Commission** expects to sell up to $37 million in revenue bonds within the next 60 days. This would complete financing of the 88-mi turnpike being built between Princeton and Charles Town, scheduled to be opened this November.

• **New asphalt plant**—A $2-million asphalt plant will be built near Chicago at Hammond, Ind., by Byerlyte Corp., of Cleveland, and Allied Materials Corp., Oklahoma City.

Activity This Week

As reported to ENR (In millions of dollars)



Amount of contracts let

	This Week	Cumulative 3 wks 1954	1953	% chge
Federal	$18.5	$52.0	$156.7	−67
State and municipal	51.9	271.5	299.7	−9
Total pub.	70.4	323.5	456.4	−29
Total priv.	103.2	271.8	601.1	−55
U. S. total	**$173.6**	**$595.3**	**$1,057.5**	**−44**
Contracts by type of work				
Waterworks	$2.8	$12.8	$13.2	−3
Sewerage	3.6	17.3	16.4	−27
Bridges	1.6	24.0	29.2	−18
Highways	9.3	90.9	95.3	−5
Earthwork, waterways	1.8	26.7	32.5	−18
Buildings: Public, excl. hsg.	30.0	112.9	141.6	−20
Housg., pub.	6.8	17.3	59.2	−71
Housg., priv.	50.6	141.0	149.7	−6
Commercial	11.2	50.5	35.3	+43
Industrial	38.7	71.7	375.3	−81
Unclassified	17.2	35.5	109.8	−68
Total	**$173.6**	**$595.3**	**$1,057.5**	**−44**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

(millions of dollars)	Week of Jan. 21 1954	Cumulative 2 Wks 1954	% chge 1953-54
Corporate securities	$25.5	$77.4	+1021
State and municipal:			
Excluding housing	42.4	58.8	−34
Housing	0.0	0.9	−61
Federal loans	0.6	3.7	−41
Federal aid	...	...	...
Total non-federal	**$68.5**	**$140.9**	**+34**
Federal approp.:			
In U. S.	...	...	...
Outside U. S.	...	...	...
Total new capital	**$68.5**	**$140.9**	**+34**

ENR indexes†		Base years = 100 1913	1926	1949
Constr. cost	Jan '54	614.04	295.17	128.72
	Dec '53	611.48	293.94	128.19
Bldg. cost	Jan '54	436.88	236.16	124.19
	Dec '53	435.90	235.63	123.91
Volume	Dec '53	547	222	158
	Nov '53	334	144	102

†Correction to ENR index tables page 70, Jan. 14, '53 issue and page 94, Jan. 7, '54—December '53 value of ENR construction cost index based on 1926 =100 is 293.94.

OFFICIAL PROPOSALS

(Continued on the following page)

Bids: February 9, 1954

Second Feeder for Navigation Aids at Runway 4-22

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
CONTRACT NYA-380.001

Sealed proposals for the furnishing and installation of a 5000 volt feeder and equipment for navigation aids at Runway 4-22 at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1111, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M., Tuesday, February 9, 1954, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1111, and copies will be furnished upon deposit of $50.00 per set. The deposit shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than forty days after the opening of proposals. The deposit will be forfeited if the documents are not so returned within the forty days.

THE PORT OF
NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, January 21, 1954

Bids: February 10, 1954

Repairs to a Covered Timber Bridge

DEPARTMENT OF HIGHWAYS
ULSTER COUNTY, NEW YORK
Kingston, New York

Sealed proposals will be received by the Board of Supervisors of the County of Ulster, New York, at the office of Robert A. Snyder, Clerk, Court House, Kingston, New York, until 3:00 P. M. on the 10th day of February 1954, at which time and place they will be publicly opened and read, for the furnishing of all labor and materials necessary for the repairs to the framework of an old covered wooden bridge, known as Perrine's Bridge, designated as County Bridge #141, spanning the Wallkill River, in the Towns of Esopus and Rosendale, Ulster County, New York.

Plans and specifications may be seen in the office of the Clerk of the Board of Supervisors, Court House, Kingston, New York, and copies of same may be secured upon application to Roland H. Green, Acting County Superintendent of Highways, 74 John Street, Kingston, New York, upon the deposit of the sum of five dollars ($5.00), which sum will be refunded if the plans and specifications are returned in good condition within twenty (20) days of bids having been received and acted upon by the Board of Supervisors.

A certified check upon a National Bank, State Bank, or Trust Company in the sum of 10% of the amount of the bid, made payable to the Treasurer of Ulster County, New York, must accompany the bid as a guarantee that the contract will be entered into if awarded.

A labor and material bond will also be required.

A faithful performance bond in the sum of one hundred per cent (100%) of the contract price will be required.

The Board of Supervisors of Ulster County, New York, reserves the right to reject any or all bids as it may deem to be to the best interests of the County of Ulster, New York.

ROLAND H. GREEN
ACTING COUNTY
SUPERINTENDENT OF HIGHWAYS

Dated: January 12, 1954

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $1.50 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, 330 West 42nd Street, New York 36, N. Y.

(Continued from preceding page)

Bids: January 28, 1954

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 28th day of January 1954, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following project in Onondaga County.

WILLIAM ROBINSON, DISTRICT ENGINEER, WEIGH LOCK BLDG., SYRACUSE 1, N. Y.

Contract No.	Type	Name of Highway and Miles	Deposit for Plans	Bid Deposit	Department Estimate
LOWSD. 54-1	Preliminary Grading, Gravel Surfacing	Lake Onondaga West Shore Development (State Fair Grounds Parking Area) 1.29 Miles	$15.00	$32,000	$593,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

Bids: February 23, 1954

Construction of Hangar No. 8

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
HANGAR NO. 8
CONTRACT NYA-370.003

Sealed proposals for the construction of Hangar No. 8 at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1111, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M., Tuesday, February 23, 1954, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1111, and copies will be furnished upon deposit of $50.00 per set. The deposit shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than forty days after the opening of proposals. The deposit will be forfeited if the documents are not so returned within the forty days.

THE PORT OF
NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, January 21, 1954

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4101) will be received at Friant, California, until February 4, 1954, for furnishing labor and materials for earthwork and structures, Lateral 24.2 Extension, Lateral 24.2-17.0W, Lateral 32.2-9.9W Extension, and Lateral 32.2-13.2W, Unit No. 3, Madera Distribution System, Central Valley Project, California. Location: Near Madera, California. Principal items are: 306,000 cu. yds. excavation; 124,000 cu. yds. earth lining; 570 cu. yds. concrete in structures; 3,580 lin. ft. 12- to 60-inch concrete pipe; 16 Mbm. timber in structures; and other work. Completion time 120 days. For particulars, address Bureau of Reclamation, Friant, California; or Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

Bids: February 2, 1954

Serrating of Existing Grid Floors of Bridges

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Department for:

Serrating the existing grid floors of the following seven (7) bridges. The total area to be serrated under the contract items is—26,628 square feet.

Rt. 35—Cheesequake Creek Bridge at Morgan, Middlesex County
Rt. 35—Manasquan River Bridge between Brielle & Point Pleasant, Monmouth & Ocean Counties
Rt. 37—Mathis Bridge over Barnegat Bay, Ocean County
Rt. 49—Maurice River Bridge at Millville, Cumberland County
Rt. S49 (1927) Rt. 47 (1953)—Grassy Sound Bridge at Wildwood, Cape May County
Rt. 56 (1927) Rt. U.S. 30 (1953)—Beach Thorofare Bridge on Absecon Boulevard, Atlantic County
Rt. 7—Belleville Bridge over Passaic River, Essex, Bergen and Hudson Counties

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., on Tuesday, February 2, 1954, at eleven o'clock (11:00 A.M. —EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J. and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Ave., Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:
STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: February 23, 1954

Paving and Utilities

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
HANGAR NO. 8
CONTRACT NYA-370.002

Sealed proposals for the construction of paving and the furnishing and installation of utilities for Hangar No. 8 at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1111, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M., Tuesday, February 23, 1954, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1111, and copies will be furnished upon deposit of $25.00 per set. The deposit shall be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than forty days after the opening of proposals. The deposit will be forfeited if the documents are not so returned within the forty days.

THE PORT OF
NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, January 21, 1954

Civil Engineer (Graduate)

with ability to translate technical Swedish to English and vice versa. General knowledge of heavy construction experience and tunneling desirable.
Submit complete resume, references, date of availability and salary requirements in first communication.

P-1129, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

SHOP SUPERINTENDENT
To take charge of structural steel fabricating plant employing less than 100 men in Middle Western city. Experience required in the fabrication of structural steel and plate work. Must also have handled labor negotiations. In reply state experience, former employers, age, education, personal references and salary expected. All replies will be held with strict confidence.

P-1370, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

REPLIES (Box No.): Address to office nearest you
NEW York: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
San Francisco: 68 Post St. (4)

POSITIONS VACANT

BUILDING ESTIMATOR and Quality Take-Off Man. Graduate Engineer preferred. Thoroughly experienced, permanent position with well established contractor with top-notch organization bidding competitively public works and commercial buildings throughout the South. Stanley W. Newman Company, Inc., P. O. Box 1646, Mobile, Alabama.

WANTED — CONSTRUCTION Superintendent. State age, experience, past 10 years. Salary and bonus basis after job. P-1259, Engineering News-Record.

ENGINEER ESTIMATOR to handle all phases of supervision, layout, etc. in Water Lines, Sewers, Tunnels structure and heavy Excavating. Must have wide experience with references for location in Ohio. Excellent salary, may have option to buy into corporation. State age and availability. P-1286, Engineering News-Record.

OPPORTUNITY—A well established construction firm in Northern New Jersey has opening for an experienced construction superintendent. Majority of work is in industrial construction. This is a real opportunity for a young man willing to accept greater responsibility. Permanent employment. Excellent salary and annual bonus assured. All replies will be held confidential. P-1319, Engineering News-Record.

WANTED: EXPERIENCED General Superintendent for Airport and Highway paving, grading, and drainage work. P-1317, Engineering News-Record.

ENGINEER—WANTED Mid-Western Cement Plant is looking for an engineer experienced in concrete construction to travel as field service engineer. For complete details, Write: P-1415, Engineering News-Record.

ROAD DESIGNERS Wanted. Experienced preferred. Permanent—38 hour week—Retirement plan. Reply stating experience, education, age. Wyoming Highway Department, Cheyenne, Wyoming.

STONE MASON working Foreman—Under 50. Rocko Cutstone Co., Pearl River, N. Y.

CIVIL, HIGHWAY, and Bridge Engineers, Designers, Draftsman, Surveyors and Corpsmen for permanent assignment on large Highway, Expressway and Bridge Program. Location Mid-Atlantic States. An opportunity with a progressive and expanding organization for producers of quality work. Submit resume; age, education, experience, title and duties, references, and salary required. P-1351, Engineering News-Record.

COMBUSTION ENGINEER wanted by a Glass Company in the Midwest. Must have a Technical background and familiarity with the burning of fuels in Industrial processes, especially natural gas, oil and other fuels including coal. P-1432, Engineering News-Record.

CIVIL ENGINEER—Well established company located in Southeastern part of the country has an opening for a graduate civil engineer who is capable of estimation bridges, docks, roads, airports and other heavy construction projects. Real opportunity for the right man. P-1431, Engineering News-Record.

WANTED

Mechanical Superintendent

Experienced in mechanical and process piping work relating to refineries, chemical plants, compressor plants, paper mills and manufacturing plants. Must have first hand knowledge of piping, rigging, millwrighting, welding and boilermaker work. Location West Coast, principally California. Submit experience record, references, availability, salary expected.

P-1379, Engineering News-Record
1111 Wilshire Blvd., Los Angeles 17, Calif.

EXPERIENCED STRUCTURAL ENGINEER

in New Orleans territory to represent large, nationally known steel fabricator. Prefer man with degree in civil engineering with practical experience in design, estimating and selling. Address replies to

P-1362, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS VACANT

STRUCTURAL ENGINEER and Detailer. Foreman Education and Degree desirable but not required. 4-years experience detailing absolutely essential. Shop and estimating experience helpful. Small shop in middle west doing light structural, miscellaneous & reinforcing. We are looking for top man who has reached a block in his present position and has capabilities of eventually assuming complete responsibilities. P-1434, Engineering News-Record.

MECHANIC, FAMILIAR with all types of heavy road equipment. Some ability to operate same. Work in central New York. P-1430, Engineering News-Record.

GRADE FOREMAN, familiar with rock, heavy excavation. Good opportunity. Work in central New York State. Experience references. P-1433, Engineering News-Record.

CARPENTER FOREMAN, familiar with all types of bridge work. Good opportunity with good concern. P-1435, Engineering News-Record.

SELLING OPPORTUNITIES OFFERED

SALES ENGINEERS — Pittsburgh, Pennsylvania with established national concern selling prefabricated metal products to engineering and construction markets. Position offered is permanent and presents excellent future with aggressive, progressive and expanding organization. Engineering degree desirable. Previous sales experience unnecessary. Age 24 to 30. Car furnished. Complete training program. Salary and bonus. SW-8254, Engineering News-Record.

SALESMEN, EXPERIENCED. For pump and wellpoint business. Established performance record. To go anywhere. Replies confidential. SW-1260, Engineering News-Record.

SALES ENGINEER—Pittsburgh, Pennsylvania and Albany, New York territories open with established national concern selling prefabricated metal products to engineering and construction markets. Positions offered are permanent and present excellent future with aggressive, progressive and expanding organization. Engineering degree desirable. Previous sales experience unnecessary. Ages 24 to 30. Car furnished. Complete training program. Salary and bonus. RW-1429, Engineering News-Record.

WANTED—SALESMAN, experienced in the sale of welded grating for sales and promotion work. Engineering background desirable. Excellent opportunity for the right man. SW-1334, Engineering News-Record.

(Continued on the following page)

DRAFTSMEN

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P-1126, Engineering News-Record
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(Continued from preceding page)

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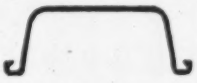

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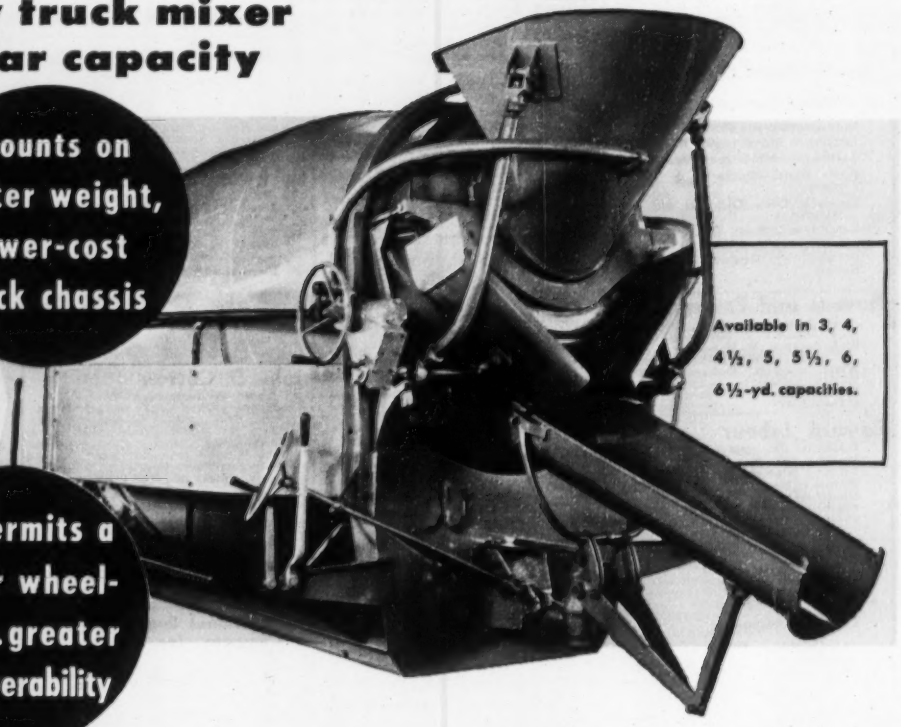

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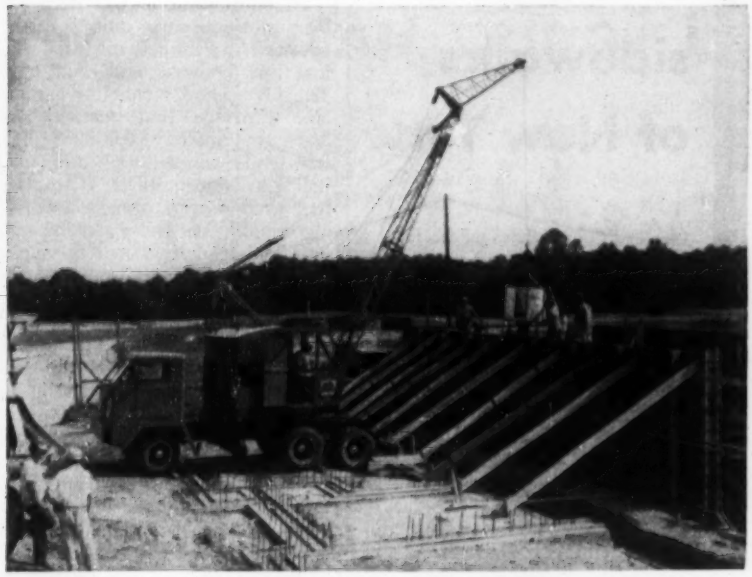


MANEUVERABILITY and versatility are key features of this new crane carrier.

Schield offers two-position carrier

The big feature of the new Bantam crane carrier is its 16½-ft turning radius that adds usefulness through maneuverability; however, it is readily pointed out that stability is in no way sacrificed.

Built to mount a Schield Bantam Model T-35, the carrier has two positions for mounting of the upper machinery. In the forward position, the machine is mounted 24 in. ahead of the bogie center on the carrier to give the operator fullest use of the Bantam's 6-ton lifting capacity. This forward position is also said to offer greater stability when the operator is working with any of the other crane attachments such as clamshell, dragline, etc.

The rear mounting position is 6 in. ahead of bogie center and is used for digging operations with back hoe and shovel attachments.

The carrier frame is fabricated from 12-in. I-beams and is mounted on six axles—ratings are 6,000 lb front, 26,000 lb on rear axles. The ten-wheeler mounts big 8.25x20 tires, and for even greater traction is equipped with a differential lock-out on the driving axles.

Power is supplied by a Hercules JXC 6-cyl gas engine developing 113 hp at 3,200 rpm. A dual range, five-speed transmission permits ten speeds forward and two reverse.

The rig measures a little more than 19 ft in length and is less than 9 ft high from the ground to the top of the basic unit cab. Width is 8 ft; wheelbase is 148 in. Total weight of the carrier less the basic crane unit but with front and rear outriggers and fenders is 11,600 lb. Front and rear pin-connected pull-out outriggers and fenders are optional at extra cost. SCHIELD BANTAM CO., WAVERLY, IOWA.

$40 fuel filter

Can save hundreds in injector repair bills

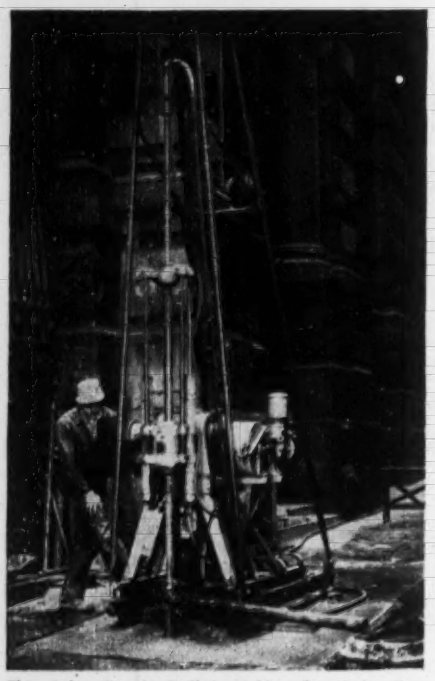
Diesel engine owners who recently have shelled out $75 per cylinder for an injector overhaul can appreciate readily the value of a filter-separator system that removes solid contaminants and all of the water from diesel fuel. Fram's new product—selling for only $40—offers owners just such a potential.

Injector parts, as any diesel mechanic knows are, generally speaking, as sensitive as an open wound. The smallest fleck of rust, dirt or other foreign matter can destroy the efficiency of an entire combustion cylinder. But solids aren't the only danger, it is now generally accepted that water can cause acid corrosion of the delicate parts, and if the water is in sufficient quantity and flowing at high speeds, a severe erosive action is set up between the highly polished surfaces of the valve seats and the finely machined holes in the injector nozzles. In any event, the result is higher fuel consumption, lower efficiency of the

(Continued on page 74)

No overhead cables on new scraper

Bucket and conveyor loading is facilitated on the new line of Westinghouse-LeTourneau scrapers by the elimination of overhead cables. Instead, the cables are reeved from a double drum power control unit through swinging, self-aligning sheaves mounted in front of the scraper yoke. The scrapers are available in four sizes in capacities ranging from 10½ to 28½ cu yd heaped. The Model O-14 shown here being dragline-loaded is the smallest of the group, but, like the other three, features high apron lift for loading and unloading of big boulders and is of all-welded construction. Le-Tourneau-Westinghouse Co., Peoria, Ill.



This Acker Teredo Drill is Making Foundation Test Borings preparatory to Erection of a New Skyscraper.

on the sidewalks of New York

Here's one of two Acker Teredo Diamond Core Drills on the job for Raymond Concrete Pile Company, making foundation test borings in the heart of the busy financial section of New York City. As repeat purchasers of Acker drills, Raymond knows the dependability, compactness and versatility that characterizes Acker design.

For prices and information, write for Bulletin 30, ENR.

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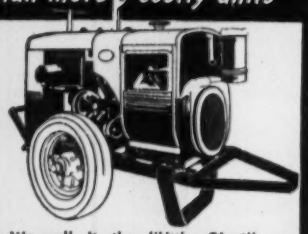

We call it the "Little Giant". Contractors call it a great big boon in a compact package. This little unit, with 6" suction and discharge, handles up to 1200 gpm — may be used for open sump work, for well-pointing and for jetting "Complete" wellpoints (if you're wise) into the ground. Its 1695 pounds are mounted in a 2-wheel chassis that is easily towed behind any vehicle. Sold at a surprisingly reasonable price; Rented if you prefer it that way. Particulars are free. Write today.

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Important facts for engineers about Vibroflotation.

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engine and eventually the need for an engine or ejector overhaul.

Here's how the Fram system works. The filter-separator unit consists of two tandem cylinders mounted on the fuel line between tank and engine. The first cylinder contains a replaceable cartridge that removes solids down to 1 micron (0.000039 in.) in size while condensing water in the fuel into large droplets. The cleaned fuel then passes through a connecting nipple into the water separating unit. Water is collected on the outside of the separator unit and drops down into the sump. A drain valve is used to remove the collected water.

The new unit can be installed quickly on diesel engines up to 225 hp and works equally well on both fresh and salt water.

During the last year the filter has been tested extensively on many types of diesel equipment under a wide variety of climatic and job conditions. These tests have been successful enough to warrant the company's offering of a money-back guarantee on the unit. FRAM CORP., PROVIDENCE 16, R. I.

Striper sprays standard or reflective highways paints

A new low-priced traffic lane marker sprays on either standard or reflective bead-type paints in a single stripe, solid or intermittent, at a rate of 3 to 5 mph.

Known as the Model 6-18, the striper has an 18-gal ASME-approved safety tank and is powered by a 6-hp Wisconsin engine. The spray gun can be set for center line marking or may be mounted on a frame outside of the wheels, either right or left, to permit working close to safety islands, curbs, etc.

The unit is self-propelled with a pivot arrangement of the rear wheel that enables it to conform to any marking job. The operator rides on a built-in trailer platform with all controls within reach. Additional features

(Continued on page 76)

IN PITTSBURGH'S GOLDEN TRIANGLE . . .

34,200 Tons of Steel Frame Construction by AMERICAN BRIDGE in 24 months!

PITTSBURGH'S new buildings have been the talk of the business world. Few cities anywhere have experienced as much commercial construction in so short a time.

For example, in the famous Golden Triangle, busy hub of this hustling metropolis, American Bridge alone erected 34,200 tons of steel framework for six towering new buildings in the two year period between April 3, 1950 and March 31, 1952.

American Bridge fabricated and erected all structural steel for the 41-story building known as 525 William Penn Place; the 31-story Alcoa building; the three Gateway Center buildings (one of which is 24-stories, and two 20-stories); and the 20-story Bigelow Apartment House.

Such an accomplishment is unusual only in the fact that all buildings are located in the downtown area of a single city . . . and that all were under construction at practically the same time. The interesting point is that one company had the facilities, the skilled manpower, and the engineering know-how to handle six sizable jobs like these with such speed and efficiency without disrupting the time schedule of the numerous other construction projects which it was handling in other parts of the country.

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Thinner, lighter insulation for water and low pressure steam lines is the manufacturer's promise for a new glass fiber product. It is said that the extra heat stopping value of the Fiberglas allows a ½-in. thickness to equal the performance of ¾ to 1-in. thicknesses of many other insulating materials commonly used in the low pressure fields.

The insulation is available with a canvas covering for installation on hot water or low pressure lines and with a black jacket of asphalt saturated kraft paper to protect against condensation on cold water lines.

Other advantages claimed for the material are that its inert fibers are rot and corrosion proof, its light weight permits easy installation and it will not buckle or sag under changes occurring in humidity or temperature conditions.

However, cold line application is limited to cold water temperatures since chilled water, ice water or refrigerated brine lines normally require greater thickness of insulation. Another product of the manufacturers, Fiberglas Dual Temperature insulation is recommended for these applications. OWENS-CORNING-FIBERGLAS CORP., NICHOLAS BLDG., TOLEDO 1, OHIO.

Added powdered metal doubles welding speed

The addition of powdered metal to the coating of a new electrode is reported to weld mild steels at speeds double those obtained with more conventional types.

According to the manufacturer, the powdered metal changes the arc action so that welds can be made by dragging the electrode in contact with the plate. Because the metal powder becomes part of the weld bead, faster welding is achieved. It is also said that spatter is decreased to less than half that obtained with regular electrodes. Tests have shown that beads produced with this Airco Easyarc 12 are exceptionally smooth and the weld metal is of high strength, good ductility and X-ray soundness.

Further information is contained in bulletin ADC 650. AIR REDUCTION SALES CO., 60 E. 42ND ST., NEW YORK 17, N. Y.

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Illustrated is GMC's 145 H.P. M470—22,000 GVW

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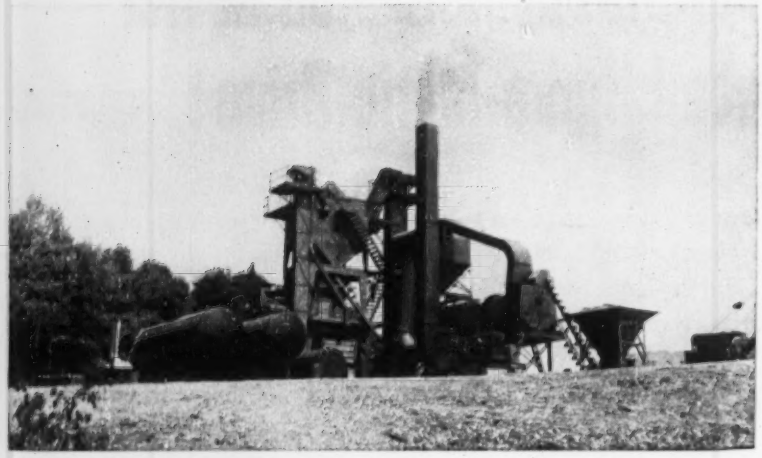

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Sewage pumps—The line of Yeomans non-clog vertical sewage pumps is described in Bulletin No. 6251. Space in the bulletin is devoted to the introduction and complete explanation of the new package sewage lift station designed for use in subdivisions, trailer parks, villages and similar projects.—YEOMANS BROS. CO., 1999 N. RUBY ST., MELROSE PARK, ILL.

Wire rope slings—The complete line of American Tiger wire rope slings is outlined in a 98-page catalog. The book is broken down into six sections that describe Tiger wire rope fittings, regular laid slings, braided four-part slings, braided six-part slings, braided eight-part slings and wire rope slings. Each section gives complete details and specifications on the particular type of sling with which it is concerned.—AMERICAN STEEL & WIRE DIV., UNITED STATES STEEL, ROCKEFELLER BLDG., CLEVELAND 13, OHIO.

Joint sealers—A new catalog describes a line of cold applied paving joint sealers for use on concrete and bituminous highways, streets, bridge decks, canal linings, airport aprons and runways and other heavy construction projects. Covered in the catalog are laboratory data, specifications and methods of application. Presstite cold applied paving joint sealers are described as sufficiently tough and elastic to withstand heavy traffic, cold and heat, with maximum adhesion and resilience to allow for repeated expansion and contraction of the pavement and still prevent infiltration of water and moisture. Application is also described as easy, rapid and economical. The catalog includes descriptions of equipment for use in applying the sealants.—PRESSTITE ENGINEERING CO., 3786 CHOUTEAU AVE., ST. LOUIS 10, MO.

Pull and lift—The Pul-Lift, a chain hoist design that either hoists or pulls, is illustrated and described in Bulletins P-260B and P-1260. Developed by Yale engineers to meet the demand for a general purpose tool, the Pul-Lift operates in close quarters by means of short strokes on a ratchet handle and can be used for riggers' equipment. It is available in ¾ to 15-ton capacities. Other advantages claimed for the device are maximum strength with minimum weight, self-actuated load brakes and complete flexibility.—THE YALE & TOWNE MFG. CO., ROOSEVELT BLVD. AND HALDEMAN ST., PHILADELPHIA 15, PA.

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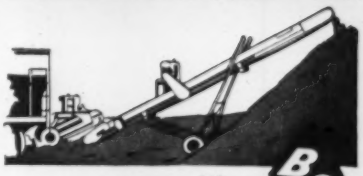

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EDITORIALS

No danger to dinosaurs

A FINE EXAMPLE of how mass hysteria can be used to distort public understanding of a major engineering undertaking is found in the current attack on the proposed Echo Park reservoir in Utah and Colorado. Spearheaded by the Sierra Club, a wildlife group on the Pacific Coast, the Federation of Western Outdoor Clubs is actively seeking to get all kinds of conservation and sporting organizations to send delegations to Washington to oppose approval of the Echo Park project at hearings that began Jan. 18.

By playing up the fact that the proposed reservoir would flood 43,000 acres of the 204,000-acre Dinosaur National Monument, the outdoor enthusiasts are leading the public to believe that the reservoir will include the dinosaur fossil beds. These truly remarkable pictures of our prehistoric past were put under the protection of the U. S. Park Service in 1915 by having the area in which they are located set up as a national monument. That engineers would damage this scientific wonder is unthinkable. The fact should be nailed down firmly that the stored waters will not come near the 80-acre area containing the fossils.

Echo Park reservoir is one of several planned as part of the program for conservation and use of the vast water resources of the Colorado River which culminated in the Colorado River Compact. Under that compact, the "Upper Basin" states must deliver 7,500,000 acre-ft of water annually to the "Lower Basin" states. To do that, the Upper Basin states must build large storage reservoirs. The Echo Park reservoir is superior to any alternate site because it stores water in the bottom of the deep canyons of the Green and Yampa rivers where evaporation losses will be low.

If these canyons were accessible to the public for recreational use, there might be a better-founded objection to using them for reservoir purposes, but they are not. They are practically inaccessible to all but a rugged few, just as was Boulder Canyon on the lower Colorado before Hoover Dam was built. Echo Park Dam, like Hoover Dam, will form a vast lake flooding only the lower part of the canyons of the Green and Yampa Rivers, opening the grandeur of the upper walls to thousands of people, just as Lake Mead has opened up Boulder Canyon.

As to the claimed "invasion" of the Dinosaur National Monument, the record appears to be clear that when the Park Service sought to have the area of the monument expanded from the original 80-acres containing fossil remains to its present area of 350 sq. mi., the Park Service agreed not to object to future water storage projects, which then were being planned. The presidential proclamation enlarging the monument is said to have such a reservation in it.

Hard facts like these, however, mean little to extremists who look on any change from natural conditions as bad. But it is to be hoped that when the hue and cry subsides, Congress will weigh all the facts dispassionately and do what it thinks will be most beneficial for the nation as a whole.

Spanish bases still beckon

THE BUREAU OF YARDS & DOCKS, the designated Defense Department construction agency for the bases in Spain project, has now made its choice of engineer and contractor groups to administer the program, which in its initial $150-million phase will include four airfields and a supply port (ENR Jan. 14 p 23). What happens next? It is a question charged with unusual interest to the profession at large and particularly to those firms which had set their sights on a Spanish job, only to be disappointed.

Because the agreement with Spain was so long in coming—and yet on the verge of being signed at almost regular intervals during the last two years or more—the roster of firms seeking a part in building the bases had lengthened to a veritable Who's Who of U. S. Construction. By the same token, the guessing as to who would be chosen had assumed the proportions of a national pastime. Those who believed they had a chance for the jobs went through alternating periods of elation and dejection as their hopes waxed and waned. Groups were formed, regrouped and disbanded. Seldom, if ever has such widespread turmoil developed over a design and construction assignment.

It is greatly to the credit of the Bureau of Yards and Docks that it handled this situation with calmness, objectivity and a great sense of responsibility. Not only did it accept for careful study all proposals made, but it attempted, by public appeal, to promote the submission of as many proposals as possible.

The choice went to four engineering firms and three contractors. The engineer group contains specialists in all of the classes of work required—port work, paving, structure design and utility planning, to mention the most obvious. At least two of the firms have had offshore experience. The contractor group has the further advantage of having worked together as a unit on a similar assignment in France, to have had much other foreign experience, and to have a large contingent of Spanish-speaking personnel.

Design and administration are, therefore, well taken care of. There remain the actual construction contracts, and these are scheduled to go to Spanish contractors on competitive bids. But both in the preparation of bids and in the carrying out of the work they are likely to want and require help. And this is where some of the U. S. firms that still covet Spanish jobs come in—on joint ventures with Spanish contractors. The Spanish bases still beckon.

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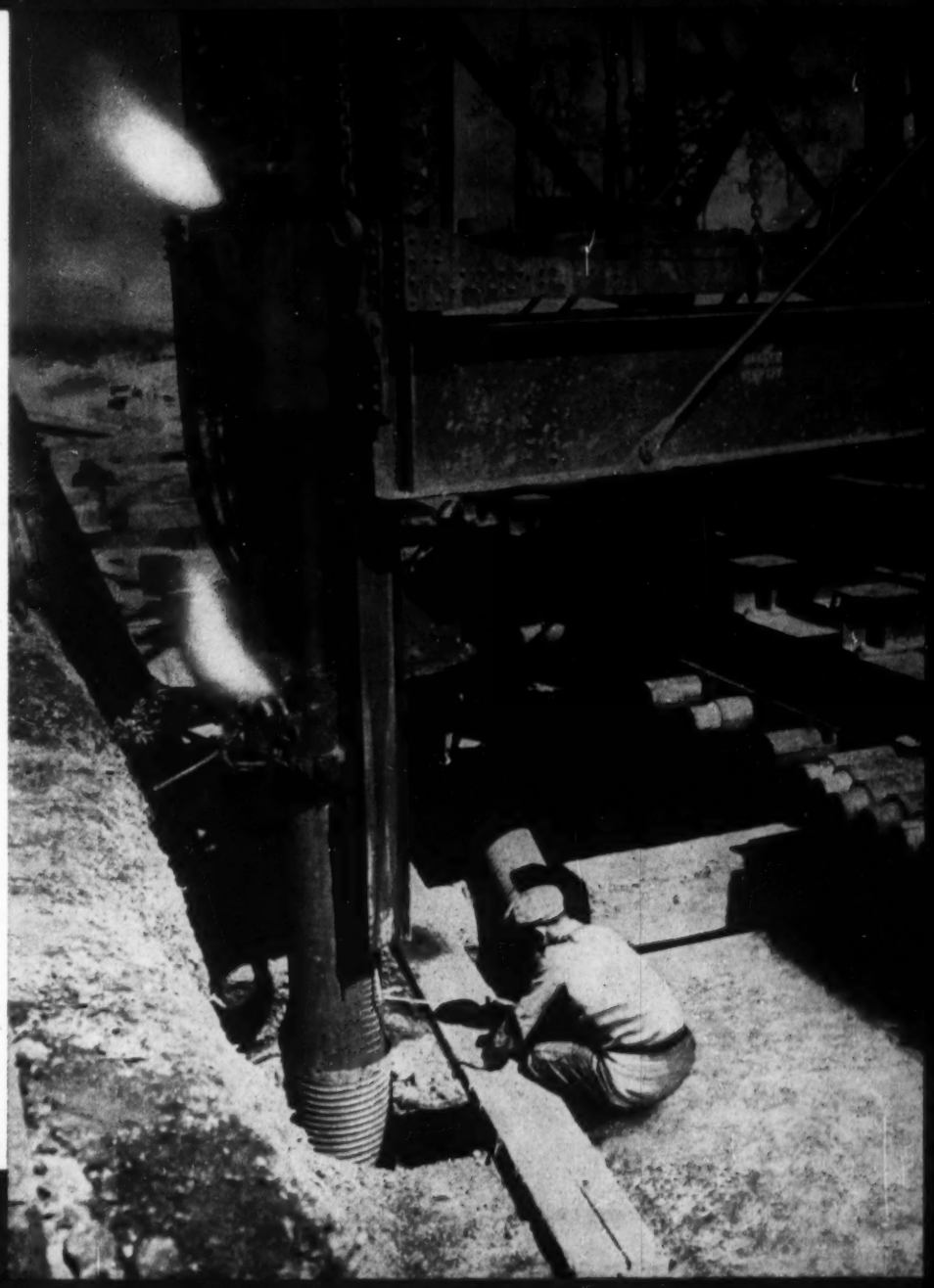

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